DOCUMENT RESUME

ED 312 433 CE 053 515

TITLE	Exploration of Construction Technology. Vocational Education Curriculum Development. Bulletin No. 1856.
INSTITUTION	Northwestern State Univ., Natchitoches, La.
SPONS AGENCY	Louisiana State Dept. of Education, Baton Rouge. Div. of Vocational Education.
PUB DATE	Feb 89
NOTE	171p.
PUB TYPE	Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE	MF01/PC07 Plus Postage.
DESCRIPTORS	*Building Trades; *Carpentry; *Construction (Process); Curriculum Development; High Schools; Industrial Arts; Occupational Safety and Health; *Shop Curriculum; *Technology; Trade and Industrial Education
IDENTIFIERS	*Louisiana

ABSTRACT

Intended to help local administrators, teacher educators, and technology education/industrial arts teachers in Louisiana improve technology education and standardize its instruction, this document contains teacher's materials for a 10-unit course in construction technology for 10th-, 11th-, or 12th-grade students. The instructional units are as follows: Rules and Regulations; Safety in the Laboratory or Classroom; Introduction to the Construction Industry; Basic Construction Tools and Equipment; Construction Mathematics; Safety and Health in Construction; Pre-Construction Planning; Construction Processes and Production; Construction Completion; and Construction in the Future. The document lists unit titles, describes the course, allots time for the units, outlines the course and presents a table that covers each unit's objectives, the time allotted for each, instructional topics, student activities, teacher activities, and references to resources. Eleven appendices comprising the bulk of the document contain instructional material (much of it in the form of illustrated handouts) for use with each unit. Appendix 11 contains information on student competitive events, and a 15-item bibliography concludes the guide. (CML)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED312433

Vocational Education Curriculum Development

EXPLORATION OF CONSTRUCTION TECHNOLOGY

Bulletin No. 1856

1989

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

[illegible]

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

LOUISIANA DEPARTMENT OF EDUCATION

WILMER S. CODY, Ed.D.
State Superintendent

CE053545

2

BEST COPY AVAILABLE

EQUAL OPPORTUNITY STATEMENT

IN COMPLIANCE WITH TITLE VI OF THE CIVIL RIGHTS ACT OF 1964, TITLE IX OF THE EDUCATION AMENDMENTS OF 1972, AND SECTION 504 OF THE REHABILITATION ACT OF 1973, THIS EDUCATIONAL AGENCY UPHOLDS THE FOLLOWING POLICY:

THIS IS AN EQUAL OPPORTUNITY INSTITUTION AND IS DEDICATED TO A POLICY OF NON-DISCRIMINATION IN EMPLOYMENT OR TRAINING. QUALIFIED STUDENTS, APPLICANTS OR EMPLOYEES WILL NOT BE EXCLUDED FROM ANY COURSE OR ACTIVITY BECAUSE OF AGE, RACE, CREED, COLOR, SEX, RELIGION, NATIONAL ORIGIN OR QUALIFIED HANDICAP. ALL STUDENTS HAVE EQUAL RIGHTS TO COUNSELING AND TRAINING.

This public document was published at a total cost of $2,746.00; 625 copies of this public document were published in this 1st printing at a cost of $2,746.00. The total cost of all printings of this document, including reprints is $2,746.00. This document was published by Louisiana Department of Education, Office of Vocational Education, Post Office Box 94064, Baton Rouge, Louisiana 70804-9064 for the dissemination of vocational education research materials for new and changing occupational fields under authority of Public Law 98-524. This material was printed in accordance with the standards for printing by state agencies established pursuant to R.S. 43:31.

EXPLORATION OF CONSTRUCTION TECHNOLOGY

PROJECT DIRECTOR

Dr. Thomas L. Eppler

Funded by
The State of Louisiana
Department of Education
Office of Vocational Education

Northwestern State University
Natchitoches, LA 71497
February 1989

FOREWORD

This publication is a guide for the improvement of instruction in Technology Education for the State of Louisiana. It presents a step-by-step approach to the activities and resources necessary to teach construction technology. It should also help local administrators, teacher educators, and Technology Education/Industrial Arts teachers in accomplishing a degree of standardization in order to meet the needs of our youth.

A constant concern for educators is the development and revision of curriculum. Industry and technology are the core of Technology Education/Industrial Arts instruction. Both are constantly changing; therefore, curriculum and instruction must change in order to provide students a realistic and accurate understanding of industry and its function in our complex technological society.

Wilmer S. Cody
State Superintendent of Education

ACKNOWLEDGEMENTS

This publication represents the cooperative efforts of Jerry O'Shee of the Technology Education/Industrial Arts Section in the Office of Vocational Education, Louisiana State Department of Education. Special recognition goes to Dr. Thomas L. Eppler, Northwestern State University, who was the Project Director in the development of the guide. Special commendation goes also to the following writing team members who worked diligently to produce this guide: Bill Bischoff, L. W. Higgins High School; J. Mickey Hebert, Lafayette Parish School System; Russell Pedro, Captain Shreve High School; Vincent D. Tuminello, Caddo Magnet High School. Also, thanks to the editor, Dr. Florent Hardy, Jr.

Don R. Wood
Assistant Superintendent
Office of Vocational Education

TABLE OF CONTENTS

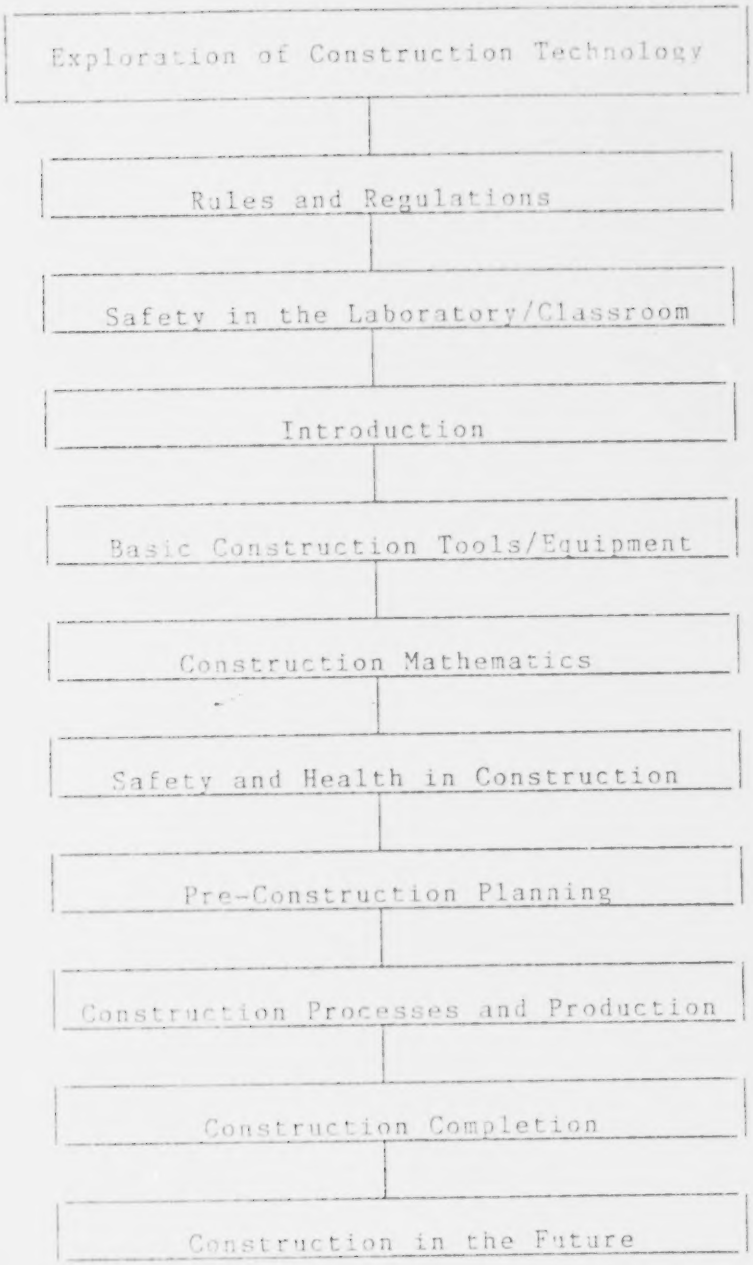
Foreword i
Acknowledgements ii
Flow Chart 1
Course Description 2
Target Grade Levels 2
Prerequisite 2
Course Goals 2
Course Objectives 2
Introduction 3
Time Allotment 4
Course Outline 5
Teaching Guides 9

Unit 1 Rules and Regulations 9
Unit 2 Safety in the Laboratory and Classroom 10
Unit 3 Introduction to the Construction Industry . . 11
Unit 4 Basic Construction Tools and Equipment 12
Unit 5 Construction Mathematics 14
Unit 6 Safety and Health in Construction 16
Unit 7 Pre-Construction Planning 17
Unit 8 Construction Processes and Production 21
Unit 9 Construction Completion 24
Unit 10 Construction in the Future 26

Appendices 27

I Rules and Regulations 27
II Safety in the Laboratory and Classroom 31
III Introduction to the Construction Industry 40
IV Basic Construction Tools and Equipment 47
V Construction Mathematics 57
VI Safety and Health in Construction 59
VII Pre-Construction Planning 67
VIII Construction Processes and Production 69
IX Construction Completion 81
X Test 97
XI Student Competitive Events 109

Bibliography 141


Exploration of Construction Technology
Rules and Regulations
Safety in the Laboratory/Classroom
Introduction
Basic Construction Tools/Equipment
Construction Mathematics
Safety and Health in Construction
Pre-Construction Planning
Construction Processes and Production
Construction Completion
Construction in the Future

Title:

"Exploration of Construction Technology"

Course Description:

"Exploration of Construction Technology" investigates all areas of the construction industry from planning to completion of light, heavy, industrial and civil construction and the various careers associated with each area.

Target Grade Levels:

Grades 10 - 12

Prerequisite:

General Industrial Arts

Course Goals:

In this course the student should become acquainted with the various steps used in the construction processes. Students will also have the opportunity to trace the development of a project from the idea or need stage through planning, designing, construction, and the completion of construction process. In addition, each student will have an opportunity to participate in hands on activities to acquaint him/her with the various tools, materials, and challenges in the construction world.

Course Objectives:

1. To develop an understanding of the technical aspects of construction.

2. To instill safe work habits in the school classroom and laboratory.

3. To acquaint the students with the four major types of construction.

4. To increase understanding of the occupational requirements and opportunities in the construction industry.

5. To gain an insight into the various tools and equipment used in construction.

6. To acquire skills in computing mathematic problems associated with the construction industry.

7. To develop an awareness of federal, state and local safety laws.

8. To develop foundations and experiences in all areas of the construction industry.

Introduction:

"Exploration of Construction Technology" describes the major types of construction. The student will be introduced to the areas of light, heavy, industrial and civil construction. The student will be able to explore the training and career opportunities available in the construction industry.

"Exploration of Construction Technology", will give the student an opportunity to investigate the three areas of construction: pre-construction planning, construction processes, production and construction completion.

"Exploration of Construction Technology" will guide the student through a construction project from initiating the project to closing the contract. Some of the areas emphasized are: zoning, financing, land survey, contracting, scheduling, permits, foundations, super-structures, installing systems, finishing the structure and landscaping.

"Exploration of Construction Technology" will address construction in the future, the challenge and ways that society may meet the challenge.

EXPLORATION OF CONSTRUCTION TECHNOLOGY

TIME ALLOTMENT

Unit I	Rules and Regulations	2 Hours
Unit II	Safety in the Laboratory/Classroom	2 Hours
Unit III	Introduction	8 Hours
Unit IV	Basic Construction Tools/Equipment	45 Hours
Unit V	Construction Mathematics	12 Hours
Unit VI	Safety and Health in Construction	5 Hours
Unit VII	Pre-Construction Planning	45 Hours
Unit VIII	Construction Processes and Production	45 Hours
Unit IX	Construction Completion	8 Hours
Unit X	Construction in the Future	3 Hours
	TOTAL	175 Hours

The suggested time frame for Exploration of Construction Technology is 175 days. The remaining 5 days are to be used as necessary for the opening and closing of laboratory/classroom, school functions, and in units where the instructor feels additional time is needed.

EXPLORATION OF CONSTRUCTION TECHNOLOGY

- A Yearly Outline -

I. State, Parish, Local School, and Classroom Legal Rules and Regulations

II. Safety in the Laboratory and Classroom

A. Safety Programming for the Teacher

B. Safety Programming for the Student

III. Introduction to the Construction Industry

A. Major Types of Construction

1. Light

2. Heavy

3. Industrial

4. Civil

B. History of Construction

1. Construction Materials

2. Construction Activities

C. Training Programs and Careers

1. Training

a. High School Followed by On The Job Training

b. Technical/Trade School-Technician

c. College/University-Engineering

2. Career Opportunities

IV. Basic Construction Tools and Equipment

A. Small Measuring Tools

1. English Graduated Tape

2. Metric Graduated Tape

3. Framing Square

4. Leveling

a. Spirit Level

b. Builders' or Transit Level

B. Basic Hand and Power Tools

C. Lifting and Earth Moving Equipment

V. Construction Mathematics

A. Angular Measurement

1. Units of Angular Measurement

2. Arithmetic Operations

B. Linear Measurement

1. Units of Linear Measurement

2. Arithmetic Operations

C. Area Measurement

1. Area of Common Polygons

2. Area of Circles

D. Volume Measurement

1. Volume of Prisms and Cylinders

2. Volume of Pyramids and Cones

VI. Safety and Health in Construction

A. Safety in the Work Place

B. Worker Responsibilities

C. Company Responsibilities

D. Government Responsibilities

VII. Pre-Construction Planning

A. Designing and Considerations

1. Initiate Project

a. Zoning

b. Building Codes

c. Financing

d. Cost Estimating

2. Select and Obtain a Site

3. Land Survey

4. Designing a Project

5. Working Drawing

6. Specifications

B. Managing Project

1. Contracting

2. Scheduling

3. Obtain Workers

4. Obtain Materials/Equipment

VIII. Construction Process and Production

A. Building Structure

1. Permits

2. Earthwork

3. Foundations

4. Superstructure

5. Enclose Exterior Structure

B. Installing Appropriate Systems

1. Transportation

2. Climate Control

3. Plumbing

4. Electrical

5. Communication

C. Finishing Structure

1. Insulating

2. Enclosing Interior Structure

IX. Construction Completion

A. Landscape Site

B. Closing Contract

1. Correcting Mistakes

2. Final Inspection

3. Transferring Project

a. Signing Releases

b. Providing Warranties

c. Receiving Final Payment

X. Construction in the Future

A. Challenge

B. Meeting the Challenge

UNIT I: STATE, PARISH, SCHOOL AND CLASSROOM LEGAL RULES AND REGULATIONS 2 H 0/3

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student will be able to: 1. Identify the State, Parish, school and classroom rules and regulations that apply.	1. State, Parish, School and Classroom Rules and Regulations	Read and sign rules and regulations handout sheet. UNIT TEST	Discuss the various rules and regulations that apply to a particular situation. Make a rule and regulation handout sheet in duplicate to be signed by the student.	(15) pp. 17-18 State Handbook Parish Handbook School Handbook (Sample) Appendix I, pp. 28-30

UNIT II: SAFETY IN THE LABORATORY AND CLASSROOM 2 HOURS

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student will be able to:	II. Safety in the Laboratory and Classroom			Appendix II
2. Identify the safety rules that are applicable to a classroom and laboratory. atory.	A. Safety Programming for the Teacher	Read and sign safety handout sheet.	Demonstrate the correct way to use classroom and laboratory equipment and materials.	(15) pp. 17-18, 22,24 (11) PP. 2.05, 3.0 Appendix II, p. 32
	B. Safety Programing for the Student	Design and make a safety poster to be displayed.	Make a safety bulletin board. Comic strip type characters could be used showing hazardous conditions.	Appendix II, pp. 33-39
		SAFETY TEST	Document and file for future reference all safety tests.	Appendix X TEST, pp. 99-100

UNIT III: INTRODUCTION TO THE CONSTRUCTION INDUSTRY 10 HOURS

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:	III. Introduction to the Construction Industry	Read chapter/answer study questions		
3. Identify major types of construction.	A. Major Types of Construction 1. Light 2. Heavy 3. Industrial 4. Civil	Construct a post and lintel, arch, truss system and observe the effect of a downward force on each of the three support systems.	Construct models of different types of support systems.	(10) pp. 7-16 (3) pp. 4-41 Appendix III, pp. 41-46
4. Trace the development of construction from its early beginnings to the present.	B. History of Construction 1. Construction Materials 2. Construction Activities	Make a report tracing the development of one kind of construction.	Slide/film presentation of various types of construction. Display various kinds of building materials.	(8) pp. 5-6 (12) pp.1-5
5. Identify various career and training programs associated with the construction industry.	C. Training Programs and Careers 1. Training a. High School Followed by On The Job Training b. Technical/ Trade School- Technician c. College/ University Engineering 2. Career Opportunities	Name one occupation in the construction industry of interest and describe the education and training necessary to enter that field. UNIT TEST	Make bulletin board depicting various careers in construction. Obtain vocational handout materials from guidance counselors and display.	(8) pp. 7, 8, Resource Center Library Appendix X TEST, p. 101

UNIT IV: BASIC CONSTRUCTION TOOLS AND EQUIPMENT 45 HOURS

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:	IV. Basic Construction Tools and Equipment	Read chapter/ answer study questions		
6. Identify and use measuring tools commonly used in the construction industry, English and metric units.	A. Small Measuring Tools 1. English Graduated Tape 2. Metric Graduated Tape 3. Framing Square	Have students practice measuring, using various tools in the English and metric system.	Develop measuring practice work sheets in the English and metric system.	(3) pp. 97-110 (13) p. 214 Appendix IV, p. 43
7. Make angle measurements with layout tools.		Using 2"x4" boards, have students construct a rectangle, then square the rectangle using the diagonal measuring method.	Demonstrate diagonal measuring.	(8) p. 103 (6) pp. 185-188
		Have students check squarness of a rectangle using the 6,8,10 mathematical method.	Demonstrate 6,8,10 mathematical squaring method.	(8) p. 103 (10) p. 270
		Layout property lines using a property description.	Demonstrate how a direction circle is used.	(13) pp. 24-30 (3) pp. 51-53 (13) pp. 147-151

23

UNIT IV: BASIC CONSTRUCTION TOOLS AND EQUIPMENT (Continued)

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:				
8. Make level and plumb measurement of objects.	4. Leveling a. Spirit Level	Using a 4-foot spirit level have students determine if the classroom walls are plumb and report findings.	Demonstrate the method of vertical and horizontal leveling, using a spirit level.	(8) pp. 103, 1
	b. Builders' or Transit Level	From an established reference elevation point, have students determine ground elevation of a point 100' away in three different directions 120° apart.	Demonstrate the correct procedure for setting up a builders'or transit level and how the instrument is used for leveling structures.	(8) p. 105 (10) pp. 27-28 (7) p. 68 Appendix IV, p. 49
9. Demonstrate the proper use of basic hand and power tools.	B. Basic Hand and Power Tools	Student could construct a project or execute selected operations utilizing basic hand and power tools.	Demonstrate proper use of hand and power tools.	(8) pp. 111-121 (8) pp. 346-351 Appendix I pp. 54-58
10. Identify various lifting and earth moving equipment.	C. Lifting and Earth Moving Equipment	Complete a handout sheet identifying various lifting and earth moving equipment. UNIT TEST	Prepare a handout sheet identifying lifting and earth moving equipment.	(10) pp. 253-26 (13) pp. 159-16 Appendix IV, pp. 59-60 Appendix X TEST, p. 119

UNIT V: CONSTRUCTION MATHEMATICS 15 HOURS

OBJECTIVES: THIS ALTERNATE	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	REFERENCES
Upon completion of this unit the student should be able to:	V. Construction Mathematics	Read chapter/answer study questions		
11. Express angular measurement degrees as degree, minutes and seconds.	A. Angular Measurement 1. Units of Angular Measurement 2. Arithmetic Operations	Determine the angular measure, ∠ 1, between hole 1 and hole 5 on a plate of metal with five holes drilled on an arc, with the angular measure between two consecutive holes being 31° 18'.	Using an overhead projector demonstrate and construct multiple angles.	(14) p. 175 Appendix V, p. 58 (10) pp. 85-90
12. Solve problems which require combinations of two or more linear measurements.	B. Linear Measurement 1. Units of Linear Measurement 2. Arithmetic Operations	Compute length of a wall with 17 studs spaced 16" on center.	Construct a bulletin board showing several types of measurements.	(14) pp. 323-331
13. Compute areas of common polygons.	C. Area Measurement 1. Areas of Common Polygons	Compute the square footage of a floor plan supplied by teacher.	Draw and hand out a floor plan with three offset rectangular segments.	(14) pp. 381-403
14. Compute areas of circles.	2. Areas of Circles	A circular walk has an outside diameter of 56'-6", and an inside diameter of 47'-6". Compute the cost of constructing the walk if labor and materials are estimated at a cost of $1.20 per square foot.	Demonstrate how to compute area problems involving polygons and circles.	(14) pp. 404-410

UNIT V: CONSTRUCTION MATHEMATICS (Continued)

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	REFERENCES
Upon completion of this unit the student should be able to:				
15. Compute volumes of prisms and cylinders.	D. Volume Measurement 1. Volume of Prisms and Cylinders	Solve a problem calculating the number of cubic yards of concrete in a [illegible].	Assign a problem which describes a rectangular [illegible] concrete slab. Solve for the number of cubic yards of concrete required.	(14) pp. 413-14 (7) p. 59
		A cylindrical hot water tank is 1.8 meters high and has a 0.5 meter diameter. Compute the volume of the tank.	Assign a problem for finding the volume of a cylinder.	(14) p. 424
16. Compute volumes of pyramids and cones.	2. Volume of Pyramids and Cones	Given a building roof in the shape of a pyramid with a square base of 36 ft. and an altitude of 15 ft., find the volume of the attic.	Using the formula $V = 1/3 Bp h$, calculate the volume of a pyramid which has a base of 48 sq. ft. and a height of 8 ft. on an overhead projection.	(14) p. 431
		UNIT TEST		[illegible]

25

UNIT VI: SAFETY AND HEALTH IN CONSTRUCTION — 5 HOURS

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:	VI. Safety and Health in Construction	Read chapter/answer study questions		Appendix VI, pp. 60
17. List the precautions that must be taken in the work place.	A. Safety in the Work Place	Develop poster depicting a safety rule being violated by a worker.	Lecture and demonstration on safe practices that should occur at the construction site.	(4) pp. 1.1-1.5 (13) pp. 3e2-3e7
	B. Worker Responsibilities	Make a list of safety rules that should be followed on a construction site.	Assign a safety poster project. Discuss safety rules as they apply to the construction site.	(4) pp. 1.1-1.5 (13) pp. 3e2-3e7
18. Explain the OSHA Safety Act of 1970 as it pertains to the construction industry.	C. Company Responsibilities	Prepare a written report titled: OSHA and the Construction Industry.	Lecture on the OSHA Safety Act of 1970. Show OSHA film pertaining to construction site safety.	(4) pp. 2.1-2.8 (13) pp. 3e2-3e7
	D. Government Responsibilities	Read government regulations from materials presented by teacher. Demonstrate in groups how accidents can occur on a job site.	Acquire pamphlets and handouts from local industries, safety councils and regional OSHA offices.	(4) Safety in the Construction Industry: OSHA Appendix VI, pp. 61-66
		UNIT TEST		Appendix X TEST, p. 104

UNIT VII: PRE-CONSTRUCTION PLANNING 45 HOURS

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:	VII. Pre-Construction Planning	Read chapter/answer study questions		
19. List and describe four major land area zones within their community.	A. Designing and Considerations 1. Initiate Project a. Zoning	Research and report to class the type zoning for the area in which you live.	Make a list of several types of structures and have students place each structure into its proper zone.	(3) p. 74 (7) p. 52 (12) p. 160 (13) P. 147
20. Gain an insight into the importance of building codes.	b. Building Codes	Write a set of building codes for materials and processes. (eg. sub-division code)	Obtain local building codes and/or a set of National Building Codes and present to the class; also have a local inspector make a presentation to the class on the various inspection phases.	(10) p. 32 (13) p. 326
21. List several means of financing a construction project.	c. Financing	Calculate the interest on $120,000.00 for 24 months at 12.5% per annum.	Discuss and instruct on several methods of calculating interest. Discuss how bonds, stocks and appropriations relate to construction financing.	(10) pp. 36-42 (12) pp. 471-47

UNIT VII: PRE-CONSTRUCTION PLANNING (Continued)

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:				
22. Prepare a cost analysis of a small building project.	d. Cost Estimating	Do a cost estimate of a construction project.	Obtain from local contractors and/or builders, cost estimate sheets that were used on past construction projects and use as study guides. Discuss ways to obtain property.	(8) pp. 36-37 (10) pp. 85-94
23. List basic requirements used in selecting and obtaining a building site.	2. Select and Obtain a Site	List the basic ways to obtain the right to use a selected site.	Research and present to the class on Eminent Domain action in the community.	(10) pp. 19-24 (7) pp. 60-71 (13) pp. 24-30
24. Explain the purpose for a land survey.	3. Land Survey	Given a topographic map, list the different symbols used to describe the natural and man made features. Given a pre-selected site, draw a survey and label all topographic symbols.	Discuss and give examples of land surveys.	(3) pp. 44-55 (7) pp. 60-71 (13) pp. 24-30
25. List the factors that must be considered in designing a project.	4. Designing a Project	Think of a project you would like to build at home. Go through the steps of the design process. Repeat the process in class within small groups.	Secure an architect/engineer to discuss designing and engineering. Discuss the factors involved in designing a project.	(7) p. 73 (10) pp. 66-70

UNIT VII: PRE-CONSTRUCTION PLANNING (Continued)

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:				
26. Recognize the major types of construction drawings. (heavy, light, industrial, civil).	5. Working Drawings	Recognize the difference between the four major types of construction drawings.	Obtain, discuss and display a set of working drawings of each of the major areas of construction.	(7) pp. 82-92 (13) pp. 84-98 (13) p. 323 (10) p. 70
27. State the purpose of written specifications for a construction project.	6. Specifications	Write cost, bidding and contract specifications for a given construction project.	Provide previously used specifications for student observation which will be used in developing their own construction project specifications.	(7) pp. 82-92 (13) p. 39 (13) pp. 78-82 (12) pp. 468-473
28. Distinguish the difference between a contractor, sub-contractor and supplier.	B. Managing Project 1. Contracting	Make a chart depicting the responsibilities of the different types of contractors.	Discuss the various responsibilities of a contractor, subcontractor and supplier.	(7) pp. 93-102 (13) p. 73 (13) pp. 120-121
29. Show the importance of proper scheduling in the managing of a project.	2. Scheduling	Organize and develop three kinds of schedules for a small construction project using the critical path method, bar chart method and progressive chart method.	Discuss and give examples of the three kinds of schedules.	(12) pp. 114-115 (10) pp. 95-98 (13) pp. 114-117 (13) p. 32

UNIT VII: PRE-CONSTRUCTION PLANNING (Continued)

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:				
30. List questions that are usually asked on job application blanks, and give reasons why the employer needs to know.	3. Obtain Workers	Complete a job application form. Prepare for a job interview.	Role playing: Teacher acts as personnel manager reviewing applications and conducting personal interviews.	Appendix VII, p. 68 (10) pp. 110-112 (7) p. 111 (13) pp. 128-134
			Collect job application forms from local business /industry and distribute to students.	(13) pp. 33-34
31. Discuss the necessity of ordering materials and obtaining equipment before construction begins.	4. Obtain Materials/ Equipment	Tell how lead time affects purchasing. Define stock, purchase order and invoice.	Give a brief discussion on obtaining materials.	(7) pp. 119-125 (10) p. 8 (12) pp. 109-110 (7) p. 7
		Contrast renting or buying equipment.	Make a comparison between renting and buying equipment.	(13) pp. 326-327
		For a class presentation, obtain, display and discuss various building materials.	Obtain building materials that were not displayed by students.	
		Identify, and state the use of various pieces of equipment.	Display assortment of tools and equipment.	
		UNIT TEST		Appendix X TEST, p. 105

UNIT VIII: CONSTRUCTION PROCESSES AND PRODUCTION 45 HOURS

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	REFERENCE
Upon completion of this unit the student should be able to:	VIII. Construction Processes and Production	Read Chapter/answer study questions		
32. Discuss the necessity of obtaining a building permit.	A. Building Structure 1. Permits	Fill out a blank building permit.	Furnish an acceptable building permit for discussion.	(7) p. 111 (12) p. 160
			Discuss the local building permit regulations.	Appendix VIII, p. 73
33. Identify the need for earth work and soil volume calculations.	2. Earth-work	What equipment and operations would be required to prepare a teacher presented site.	Discuss the how/why of earth moving.	(12) pp. 153-158 pp. 159-161 (7) p. 153
		Calculate soil volume in cubic feet and cubic yards.	Present various problems in calculating soil volume.	Appendix VIII, pp. 70-72 (13) 24-25
34. Explain the construction technology used in building various foundations.	3. Foun-dations	Identify and explain the various parts of a foundation and the factors that determine foundation construction.	Demonstrate different types of foundations and the purpose of each.	(7) p. 165 (13) pp. 31, 32 (10) pp. 203-221 Appendix VIII, p. 83 (13) pp. 31-32
			Demonstrate a concrete slump test.	(8) pp. 179-179 Appendix VIII, pp. 75-76
35. Identify the four types of super-structure.	4. Super-structure	Give name and/or locate local structures that depict the four types of super-structure.	Give a brief presentation on the four types of superstructure.	Appendix VIII, pp. 77-79 (13) pp. 185-189
			OPTION-As an alternative to any of these activities, students may build a structure of his/her own design.	(8) pp. 192-199 (7) Work Book p. 39 pp. 151-153

UNIT VIII: CONSTRUCTION PROCESSES AND PRODUCTION (continued)

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:				
36. Discuss methods of enclosing exterior structures.	5. Enclose Exterior Structure	Discuss and demonstrate the types of enclosing exterior materials.	Give a brief presentation why a structure is enclosed. Demonstrate how to install various enclosing exterior materials.	(7) p. 186 (13) pp. 248-254
	B. Installing Appropriate Systems			
37. List and describe ways to move people and freight throughout a structure.	1. Transportation	Research and build a scale model of a transportation system.	Discuss different transportation systems.	(7) pp. 203-211 (12) pp. 434-523
38. Discuss how heated, cooled or cleaned air is distributed throughout a structure.	2. Climate Control	Make a scale model of different heating/cooling distribution systems.	Discuss ways to change climate inside a structure and research and introduce innovative systems.	(7) pp. 212 (8) pp. 279-291 (12) pp. 285-290
39. Discuss the plumbing and pipeline systems.	3. Plumbing	Discuss the major pipes and fittings used in the plumbing and pipeline system. Contrast plumbing and pipeline systems.	Give a brief presentation on the installing, kinds, uses and materials of plumbing systems.	(7) p. 221 (12) pp. 291-303 (10) pp. 337-341 (8) pp. 269-275

UNIT VIII: CONSTRUCTION PROCESSES AND PRODUCTION (Continued)

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:				
40. List and describe the components of an electrical power system.	4. Electrical	Collect a variety of electrical parts and develop a display.	Give a brief presentation on electrical power systems.	(7) p. 230 (10) pp. 229-23 (12) pp. 304-31
		Design an electrical power distribution plan for a structure.	Demonstrate on an activity board the proper method of wiring electrical switches, lamps, and duplex outlets.	Appendix VIII, p. 80
41. Differentiate between monitoring and interchange communication systems.	5. Communication	Wire a door bell system on a circuit board.	Explain the difference between the monitoring and interchange system.	(13) pp. 237-238
42. Explain heat transfer and how it is controlled.	C. Finishing Structure 1. Insulating	Perform an experiment to determine the effectiveness of an insulating material.	Discuss the different types of insulation materials and their applications.	(7) Work Book p. 51 (10) pp. 202-204
43. Describe the types of interior enclosures.	2. Enclosing Interior Structure	Discuss and demonstrate the application of the types of enclosing interior materials.	Give a brief presentation on the materials used to enclose the interior of a structure.	(10) pp. 220-228
		UNIT TEST		Appendix X TEST, 106-107

UNIT IX: CONSTRUCTION COMPLETION 8 HOURS

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:	IX. Construction Completion	Read chapter/answer study questions		
44. Describe a landscaping plan.	A. Landscape Site	Design a landscaping plan for a small area of the school ground and submit the plan to a beautification or conservation program in your community that may provide funding for the implementation of the plan.	Have a landscape architect speak to your class on landscaping techniques.	(8) pp. 326-333 (10) pp. 357-362 (7) p. 279 (3) pp. 459-468
45. Describe why contractors, public officials, designers, lenders and owners inspect construction projects.	B. Closing Contract 1. Correcting Mistakes 2. Final Inspection	With a blank inspection sheet, students will make a physical inspection of the school plant.	Have your local director of permits and inspections discuss with your class about building inspections.	(7) pp. 289-295
			Emphasize the importance of a final inspection and the continuation of inspections throughout the life of the structure.	(10) pp. 104-108 (12) pp.320-325

UNIT IX: CONSTRUCTION COMPLETION (Continued)

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:				
46. Explain the three main activities involved in closing a project.	3. Transfering the Project a. Signing Releases b. Providing Warrantees c. Receiving Final Payment	Participate in a class discussion on completing a contractor's warranty and a contractor's release form.	Explain the following activities involved in transferring a project: 1. Signing releases 2. Providing warrantees 3. Receiving final payments	Appendix IX pp. 82-96 (3) pp. 17-18, 20-21, 30-31 (7) p. 289 (12) pp. 400-404
		UNIT TEST		Appendix X TEST, p. 103

43

UNIT X: CONSTRUCTION IN THE FUTURE 3 HOURS

OBJECTIVES/TIME ALLOTMENT	TOPICS	STUDENT ACTIVITIES	TEACHER ACTIVITIES	RESOURCES
Upon completion of this unit the student should be able to:	X. Construction in the Future	Read chapter/answer study questions		
	A. Challenge	Give a brief presentation of problems construction technology is expected to solve.	Explain the need for new and innovative tools, materials and methods to be used in the construction industry.	(7) p. 303 (13) p. 356
47. Describe what changes will have to be made to meet the demands for structures of all kinds in the future.				
48. Identify the challenge of the future.	B. Meeting the Challenge	Using the computer and/or other new innovative tools, demonstrate how they may be used to meet the challenge of the future.	Discuss and demonstrate new and innovative tools to be used in meeting the challenge of future construction.	(12) pp. 433-438 (13) pp. 358-359
		UNIT TEST		

APPENDIX I

RULES AND REGULATIONS

Suggested Classroom Rules and Regulations Students Should Follow:

1. Talking is absolutely forbidden:
   whenever the teacher is talking.
   whenever any test, examination or quiz is in progress.
   whenever any other student has the floor.
   whenever there is any kind of audiovisual presentation in progress, such as a film, filmstrip, etc.

2. Do not talk loudly.

3. Do not make disrespectful remarks to the teacher.

4. Do not bring radios, tape players, or other entertainment devices to class.

5. Do not leave paper or trash in the desks or on the floor.

6. Do not mark or otherwise deface school property. This includes desks, floors, walls, chairs, books, etc.

7. Do not move to another seat other than the one assigned to you without approval of the teacher.

8. Do not be tardy to class.

9. Do not leave the classroom without a hall pass.

10. Do not congregate in the doorway before or after class.

11. Do not enter the office and storage room, and do not open cabinets without prior permission to do so.

12. Do all work in class under the teacher's supervision. Only supplementary work or drawings may be done outside of class.

13. Complete all makeup work no later than five days after an absence.

14. Do not do work from other classes in this class without special permission.

15. Other than for official meetings, do not leave to go to another teacher's room without a written note from that teacher and approval from the teacher.

16. Use cover sheets for all quizzes and tests.

17. Use five minutes at the end of each hour to clean up and put away equipment and materials (only five minutes). The teacher will signal the start of this clean up.

18. Remain seated at your desk until dismissed by the teacher (not when the bell rings).

19. Be sure that your desk and stool are in order before leaving the class.

20. Enter and exit through the front door only.

EXPLORATION OF CONSTRUCTION TECHNOLOGY

SUGGESTED STUDENT EXPECTATIONS

I. Students will be expected to bring the following materials to class each day:

1. notebook
2. pencil
3. textbook (when issued)

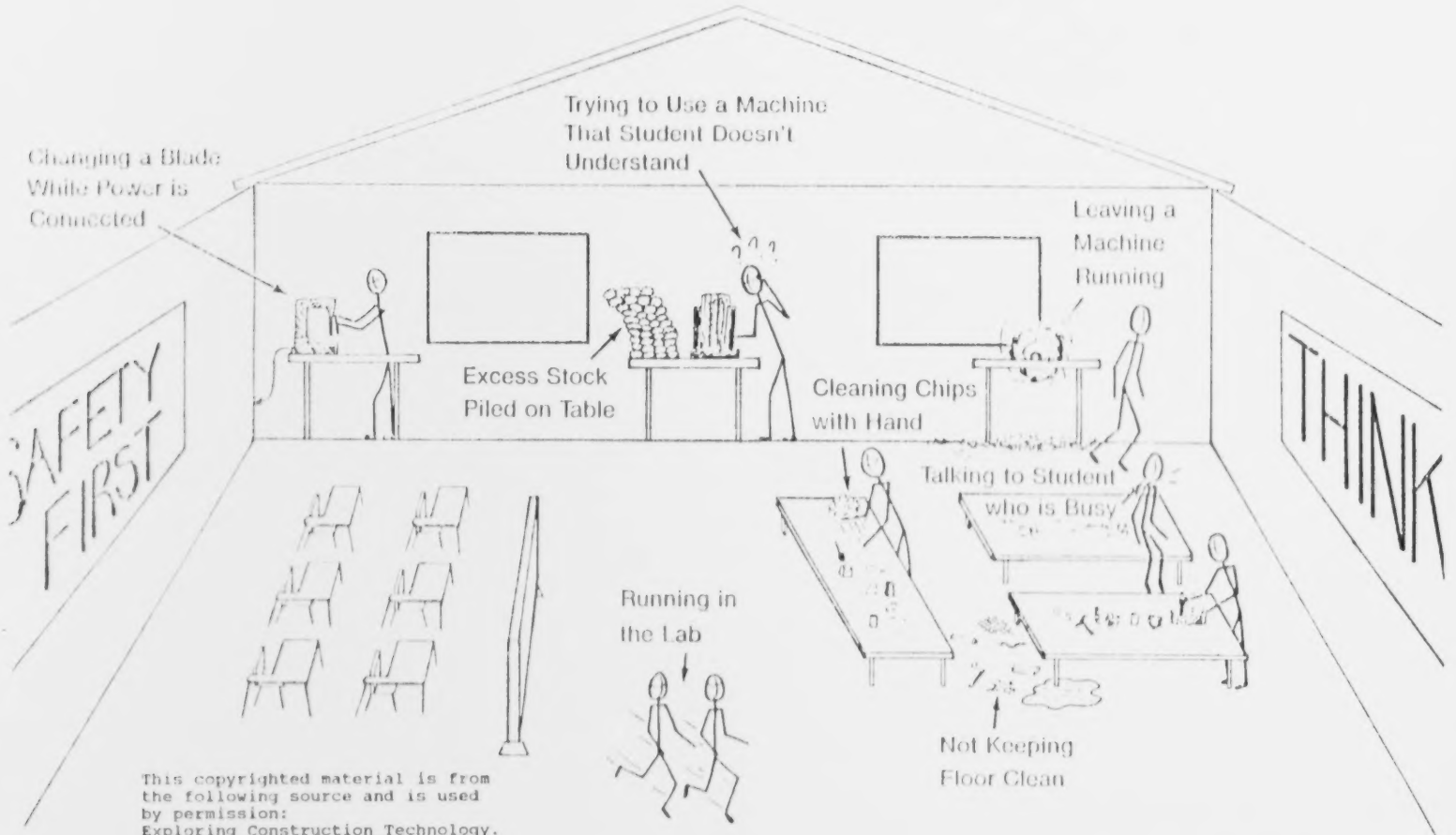
II. Students will be expected to be in their assigned seats and prepared to begin class when the tardy bell rings.

III. Students will be courteous and respectful to their classmates as well as to the teacher during class activities by listening while others speak.

APPENDIX II

SAFETY IN THE LABORATORY AND CLASSROOM

Safety Hazards in the Lab


Changing a Blade While Power is Connected
Trying to Use a Machine That Student Doesn't Understand
Leaving a Machine Running
SAFETY FIRST
Excess Stock Piled on Table
Cleaning Chips with Hand
THINK
Talking to Student who is Busy
Running in the Lab
Not Keeping Floor Clean

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 61

UNIT II

RESPONSIBILITIES FOR SAFETY

In each school situation, the instructor and school administrators have the legal responsibility for accidents that involve students or visitors while they are within the school setting. This responsibility may also extend to supervisors, local school boards, the Office of Vocational Education, the State Department of Education, and even the State Board of Elementary and Secondary Education. Students and parents are also charged with responsibilities for safety. Each has a role to play which should develop acceptable attitudes and desirable behavioral patterns in all persons involved.

Responsibilities of the State Department of Education

Ultimate responsibility for safety instruction rests with the State Department of Education, this task being shared with the Board, the State Superintendent, the division heads, and the state supervisors. However, those closest to the classroom activities will have the largest burden of the daily routine of carrying out an effective safety program.

The State Department of Education should:

1. Set policies for safety program development and implementation.

2. Provide funding for safe facilities and safety equipment.

3. Provide expert assistance to vocational/technical schools and individual parish school systems in the development of accident prevention programs.

Responsibilities of Local School Boards and Superintendents

The parish school system controls the budget, the curriculum, and the personnel policy to a major degree. Without parish-level support, safety program effectiveness will, at best, be spotty, implemented by dedicated personnel and ignored by others.

The following functions are considered the responsibility of the school board and the superintendent in a comprehensive safety education program:

1. Provide separate funding for facility maintenance and improvements, and safety supplies and equipment necessary to produce a safe instructional environment.

2. Provide for the inservice training of teachers in the area of safety.

3. Appoint a person in the parish school system to be responsible for coordinating safety and adopt a job description which reflects that responsibility. Such a safety coordinator would have the following responsibilities:

   A. Coordinate school safety functions.

   B. Set up school safety committees.

   C. Provide for, and participate in, school safety inspections.

   D. Establish a communication system to keep teachers and administrators abreast of new standards and procedures.

   E. Provide for, and assist in, establishing teacher inservice training programs.

   F. Provide for and assist in the implementation of safety instruction programs for students.

   G. Provide for and assist in the investigation of and recording of accidents and injuries.

   H. Research special safety problems.

   I. Obtain and disseminate regulatory material (policies, guidelines, inspection checklists, posters, etc.).

   J. Analyze and report all accidents. (See suggested accident report in this document.)

Responsibilities of the Director, Principal and/or Department Head

The individual school is the key organization for accident prevention. The school administrator is likely to be the person who is most directly responsible for the school's industrial arts/vocational-technical safety program. If a specialized supervisor of department head functions with the principal, or director, and works directly with the teachers, some of the responsibilities may be delegated.

The following functions are considered the responsibility of the school administrator in a comprehensive safety program:

1. Secure support from, and maintain liaison with administration above your level.

   A. Secure approval for the safety education program.

   B. Secure adequate budgetary support.

C. Expedite building and equipment changes necessary for safety.

D. Arrange for the procurement of safety equipment.

E. Ensure that appropriate staff members are kept informed of the specific maintenance requirements for safe operation of vocational education/industrial arts facilities.

F. Carefully select instructors for specific knowledge and ability to establish safe practices, procedures, and environment.

G. Arrange for administrative measures to reduce the liability exposures of staff members.

2. Provide leadership in safety program planning.

A. Initiate a specific program of safety education.

B. Set up instructional inservice training in accident prevention.

C. Encourage the instructional staff to maintain first aid proficiency. Require that safety supplies and emergency handling procedures are current and properly organized.

D. Encourage the instructional staff to be knowledgeable and proficient in the use of fire fighting equipment.

E. Instruct the staff members in the use of this safety manual and the development of a comprehensive safety program.

3. Secure action on a program of safety education that will involve not only the vocational education/industrial arts student, but also the entire student body.

A. Check periodically to make sure an adopted safety education program is in effect.

B. Observe teachers for assurance that safety instruction is a functioning part of the course of study.

C. Stimulate the discovery, analysis, and prompt correction of unsafe conditions or practices.

D. Support teachers in enforcing safety regulations.

E. Receive and review accident reports.

F. Use acceptable parish and/or state procedures for investigating and analyzing accidents.

4. Provide safe facilities and services.

A. Report to higher administration personnel unsafe conditions which cannot be corrected at the school level.

B. Plan with teachers for the correction of unsafe conditions and other hazards, and for the installation of safety devices.

C. See that facilities are inspected regularly for the condition of equipment, and safety devices, proper housekeeping, and adequacy of exits, ventilation, and material handling systems. Make necessary improvements as indicated by the inspection review.

D. See that safety and applicable safety regulations are specifically reviewed in the planning of new or remodeled facilities.

E. Provide class sizes that are in keeping with the capacity, square footage, and the number of work stations available in each facility.

F. Provide a procedure for the removal of students who repeatedly violate established safety rules and regulations and are thereby identified as safety hazards.

5. Secure the cooperation of outside personnel and agencies.

A. Assist teachers in locating qualified community personnel and services that can provide resources for the safety program.

B. Encourage qualified outside individuals to become involved in the school shop safety programs.

C. Establish communication with parents and members of the community for developing a positive attitude toward safety and the school safety program.

Responsibilities of the Teacher

The major responsibility for laboratory safety instruction in accident prevention falls on the teacher. The following are considered the responsibilities of the teacher in a comprehensive accident prevention program in school laboratories:

1. Incorporate safety instruction in the course of study and maintain documentation as to who received instruction and when instruction was given.

2. Present instruction on potential hazards and accident prevention specific to the particular school laboratory.

3. Instigate a comprehensive safety program for your particular school laboratory.

4. Develop specific safety practices, rules, and regulations relating to your facilities, and provide for their enforcement.

5. Keep informed of new and accepted safe practices for accident prevention.

6. Provide proper instruction in the use of all tools, machines and equipment. Keep a record of each student's attendance, safety training, and safety evaluation.

7. Require that a student be enrolled in your program and receive the required safety instruction prior to working in the laboratory.

8. Set a proper safety example for students to follow.

9. Insist that adequate eye protection be worn in the shop at all necessary times.

10. Insist on proper protective equipment in the shop areas, and require students to wear proper clothing and adequate hair guards while working in the laboratory.

11. Devise and enforce safe housekeeping procedures.

12. Insist that guards meeting accepted standards be provided and used whenever a machine is operated.

13. Establish and maintain the safest possible working environment.

14. Have set, preplanned procedures in case of an accident or emergency.

15. Provide prompt and thorough reports of accidents, including:

    A. A written report by the instructor.

    B. Written accounts by witnesses.

    C. Photographs of the accident scene and conditions.

16. Always provide for the supervision of students in the classroom or laboratory in accordance with legal requirements.

17. Be aware of the emotionally disturbed and accident-prone student.

18. Regularly review laboratory facilities to maintain safe conditions. Give special attention to:

    A. The layout

    B. Utilities and building services

    C. Equipment guarding

    D. The storage and condition of tools

    E. The storage, labeling, and handling of materials

19. Make recommendations to administrators for improving safety conditions.

20. Implement recommendations of the administrator for improving safety instruction.

Responsibilities of Students

The students should recognize that because of their lack of experience they must take extra care to use their best judgment always and to safeguard themselves and others while working in the shop. However, each student must assume some of the responsibility for his/her own safety and that of classmates. The student has responsibilities, as follows:

1. Work within the bounds of school policies and safety regulations.

2. Develop desirable behavioral patterns and attitudes by accepting directions, advice, and counsel from instructors.

3. Accept personal responsibility for assisting in the safety program and working toward its success.

RESPONSIBILITIES OF STUDENTS FOR SAFETY

1. WORK WITHIN THE BOUNDS OF SCHOOL POLICIES AND SAFETY REGULATIONS.

2. DEVELOP DESIRABLE BEHAVIORAL PATTERNS AND ATTITUDES BY ACCEPTING DIRECTIONS, ADVICE, AND COUNSEL.

3. ACCEPT PERSONAL RESPONSIBILITY FOR ASSISTING IN THE SAFETY PROGRAM AND WORKING TOWARD ITS SUCCESS.

APPENDIX III

INTRODUCTION TO THE CONSTRUCTION INDUSTRY

XI. Types of bridges

A. Truss bridges — Trusses are often used instead of beams to support the roadway. A truss is a rigid framework, made by connecting long, straight pieces of wood, steel, or aluminum. These connected pieces form triangles. Several trusses are shown below.

Warren truss

Subdivided Warren truss

Pratt truss

K-truss

(NOTE: Trusses must be carefully designed to span great distances and withstand tension and compression stresses.)

B. Arch bridge — Modern arch bridges are made of steel and reinforced concrete and are used to span deep ravines.

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 110

INFORMATION SHEET

C. Suspension bridge — Used over very long crossings. These bridges are made of thousands of parallel, galvanized-steel wires. The cables pass over a tower.

D. Slab bridge — The simplest type of bridge. Is made of reinforced concrete slabs for short spans. On longer spans beams are used to support the slab.

(NOTE: A bridge designer will decide on what type of bridge to build, what building materials to use, and the size of the bridge required based on the location, purpose, and required strength of the finished bridge.)

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 110

DESIGN AND PLANNING
UNIT III

JOB SHEET #1 — DESIGN AND BUILD A TRUSS BRIDGE

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 127

A. Tools and materials

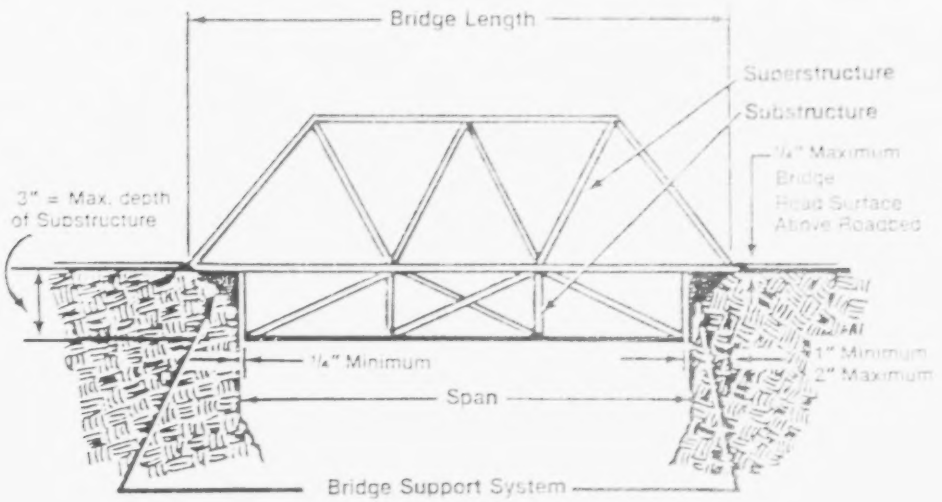
1. Balsa wood 1/8" × 1/8" strips
2. White glue
3. Cutting surface
4. Utility knife and blade
5. Straight pins
6. Ruler, 12"

B. Procedure

1. Follow instructor's directions for setting up work area.
2. Use a piece of plain paper and design a truss bridge with a span of 14" and a width of 4".

   (NOTE: Refer to Information Sheet, Section XI for truss designs. Others may be designed by you.)

   FIGURE 1



JOB SHEET #1

3. Construct bridge by joining the wood pieces together with the white glue.

   (NOTE: Do not use lamination on the construction process. Lamination is where two or more pieces of wood are glued together surface to surface without interruption.)

4. Use straight pins to hold glue joints together until dry.

5. Store bridge in drying area.

6. Clean up area.

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 128

DESIGN AND PLANNING
UNIT III

JOB SHEET #2 — STRESS TEST A TRUSS BRIDGE

A. Tools and materials

1. Completed truss bridge from Job Sheet #1 (allow 18 hours or overnight drying time)

2. Testing equipment (provided by instructor)

   a. Testing block

   b. Testing hook

   c. 2 five (5) gallon pails

   d. Lead shot weight or sand

   e. Large plastic cup or can

   f. Scales

   g. Calculator

   h. 2 tables or other device for bridge support system when testing

B. Procedure

(NOTE: To qualify for testing, the bridge must have a span of 14" and a width of 4" as stated in Job Sheet #1.)

1. Measure and record amount of wood used in the construction of the bridge.

2. Measure and record width and span.

3. Attach testing block and hook.

4. Place bridge between support system.

5. Suspend empty 5 gallon bucket on hook.

6. Place lead shot weight or sand in second 5 gallon bucket.

7. Begin pouring lead shot or sand by cupfuls into suspended bucket until the weight breaks the bridge.

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology
Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 129

JOB SHEET #2

8. Weigh sand and bucket.

9. Calculate efficiency using the following equalizing formula:

$$\text{Efficiency} = \frac{\text{Failure Weight}}{\text{Length of wood used}}$$

10. Clean up test area.

*This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 130

APPENDIX IV

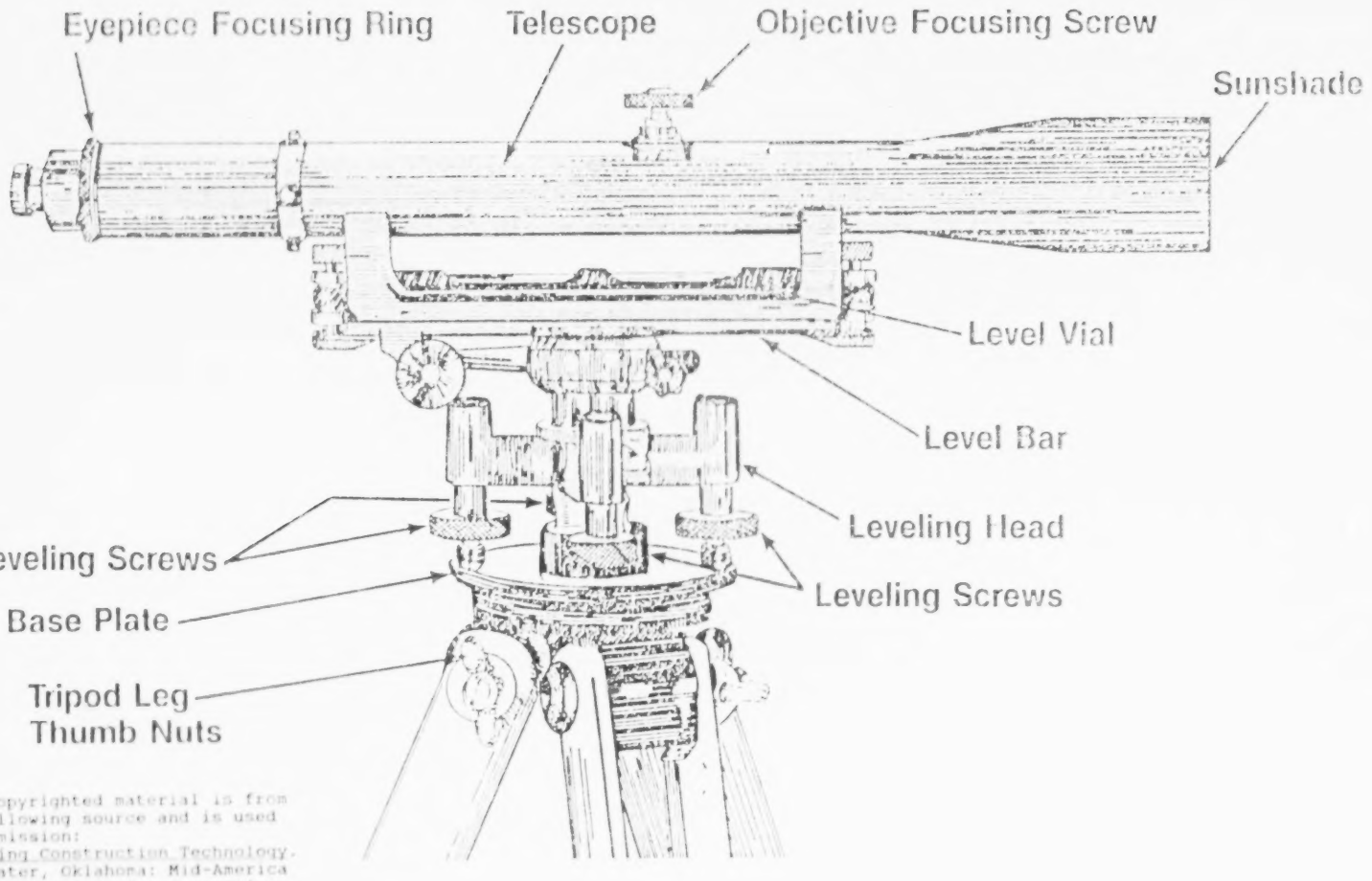
BASIC CONSTRUCTION TOOLS AND EQUIPMENT

SCALE EXERCISE

SCALE	LENGTH	RATIO
6" = 1'-0"		
1/2" = 1'-0"		
3/16" = 1'-0"		
1 1/2" = 1'-0"		
3/8" =1'-0"		
1/4" = 1'-0"		
3/32" = 1'-0"		
3/4" =1'-0"		
3" = 1'-0"		
1" = 1"		

Measure the distance between the vertical lines using the given scale. Place the length measurement in the center blank and the ratio above the line on the right.

Parts of a Level



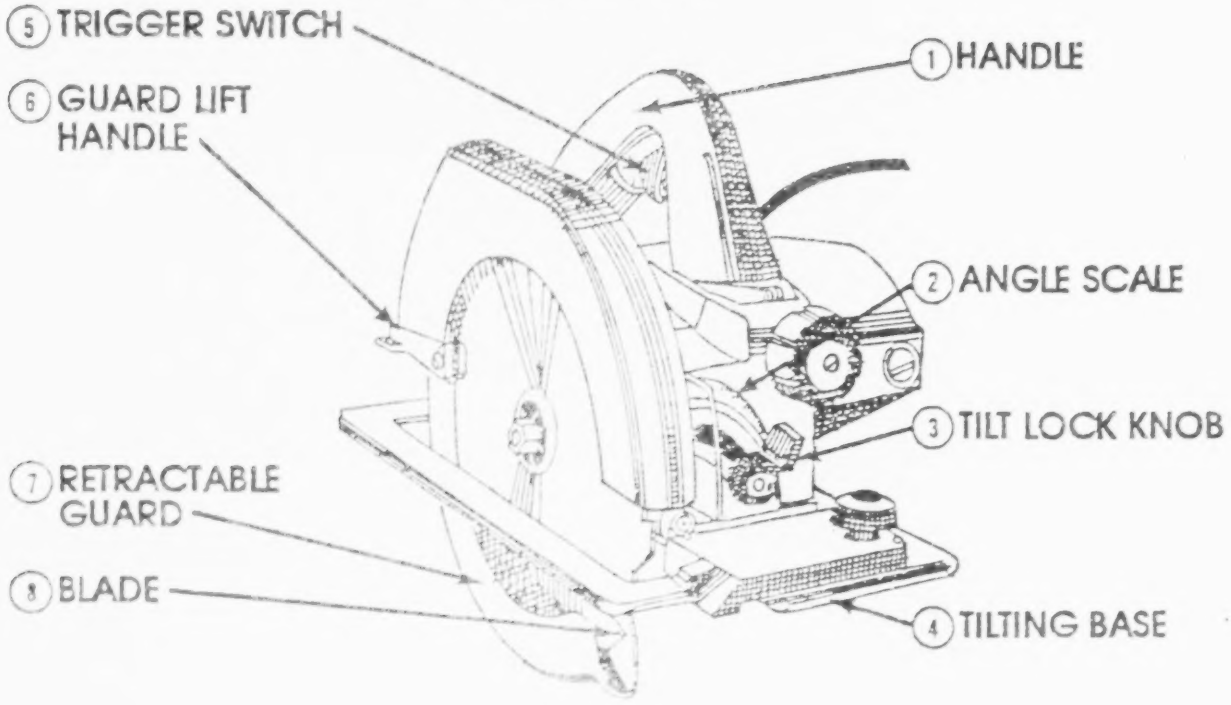
This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 146

OBTAIN PERMISSION FROM THE INSTRUCTOR
BEFORE USING THIS MACHINE.

Portable Circular Saw

SAFETY SUGGESTIONS

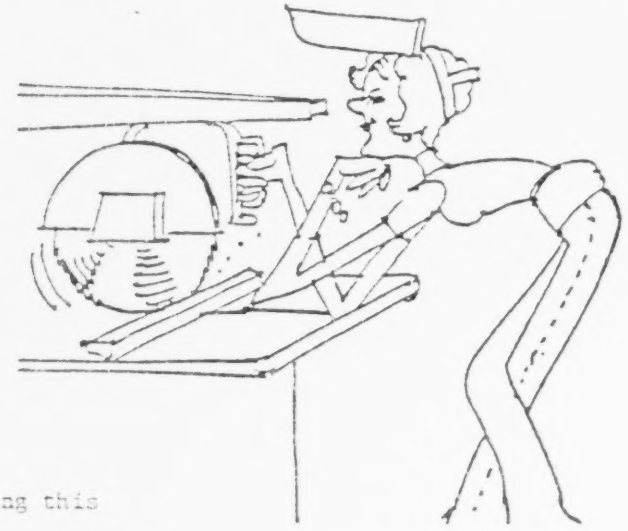
1. Make sure that telescoping guard returns automatically to cover the blade after each cut.
2. Do not set saw down until blade stops.
3. Eye protection must be worn while using saw.
4. If the saw blade binds or smokes, stop cutting immediately.
5. Make sure the power cord is clear of the blade.
6. Be sure the material you are cutting is adequately supported.
7. Remove tie, rings and watch, and roll up sleeves.
8. Check the base setting for the proper depth of cut.



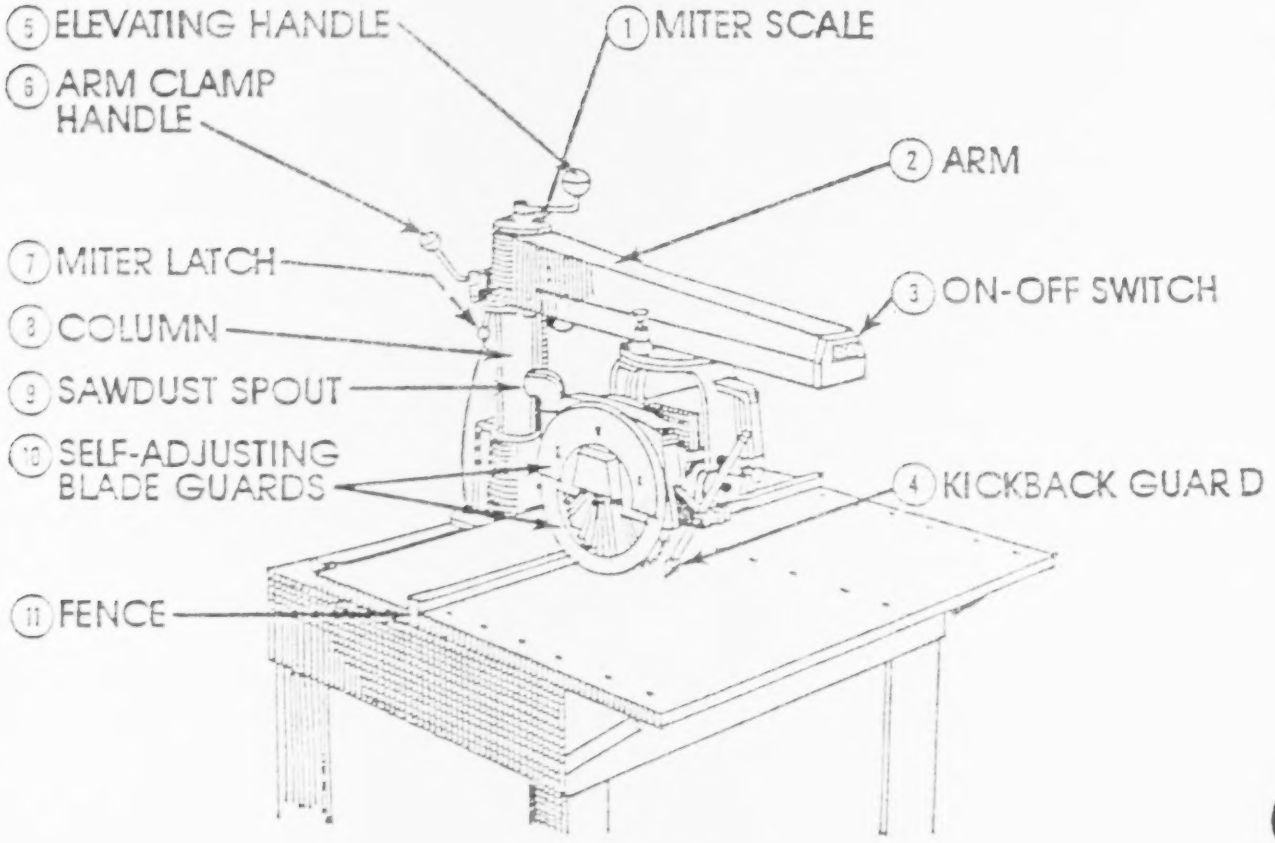
OBTAIN PERMISSION FROM THE INSTRUCTOR
BEFORE USING THIS MACHINE.

Radial Arm Saw

SAFETY SUGGESTIONS



1. Be sure that the saw travels easily on the arm.
2. Be sure that the blade will not extend beyond the front of the table.
3. Before starting make sure that the guard telescopes properly.
4. Make sure that the blade is stopped before leaving the machine.
5. Make sure that the material being cut is tight against the fence.
6. Eye protection must be worn while operating this machine.
7. Be sure the saw returns to the rear of the table at the completion of the cut.

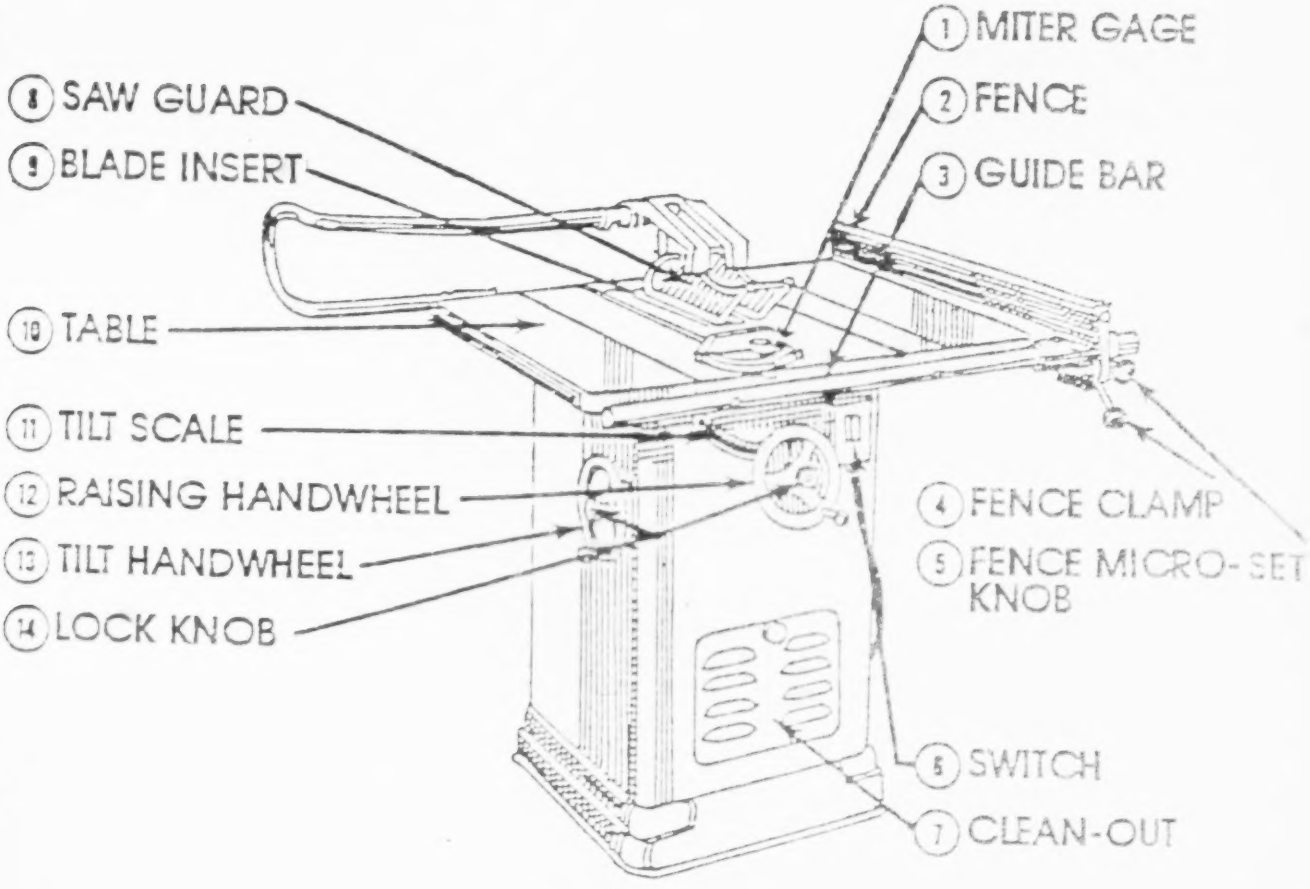


OBTAIN PERMISSION FROM THE INSTRUCTOR
BEFORE USING THIS MACHINE.

Table Saw

SAFETY SUGGESTIONS

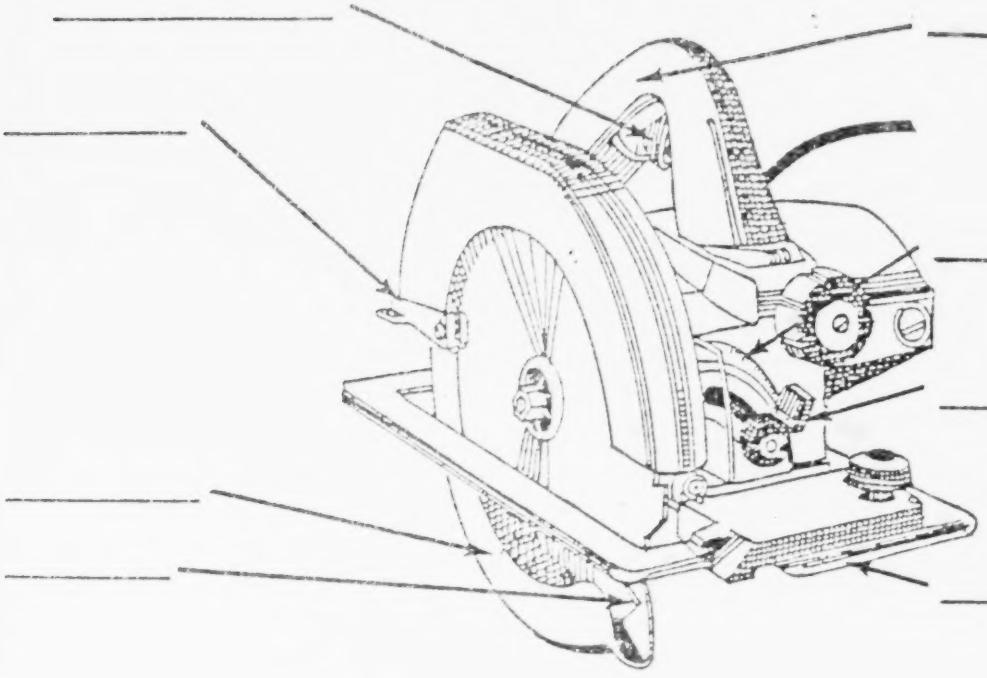
1. Wear approved eye protection.
2. Remove jewelry, eliminate loose clothing and confine long hair.
3. Use properly secured and adjusted guards at all times.
4. Make all adjustments and remove scraps with the machine completely stopped.
5. Select proper blade and set at correct height (1/8 inch above wood).
6. Never saw freehand - never reach over the saw blade.
7. Stand to the side - not in line with the blade.
8. Make sure blade is installed with the teeth pointing in the proper direction.
9. A push stick should be used when the hands come within 3 inches of the blade.
10. Use the rip fence for ripping and miter gauge for crosscutting.
11. Stop the machine, lower blade below table, and clean up scraps when completed.



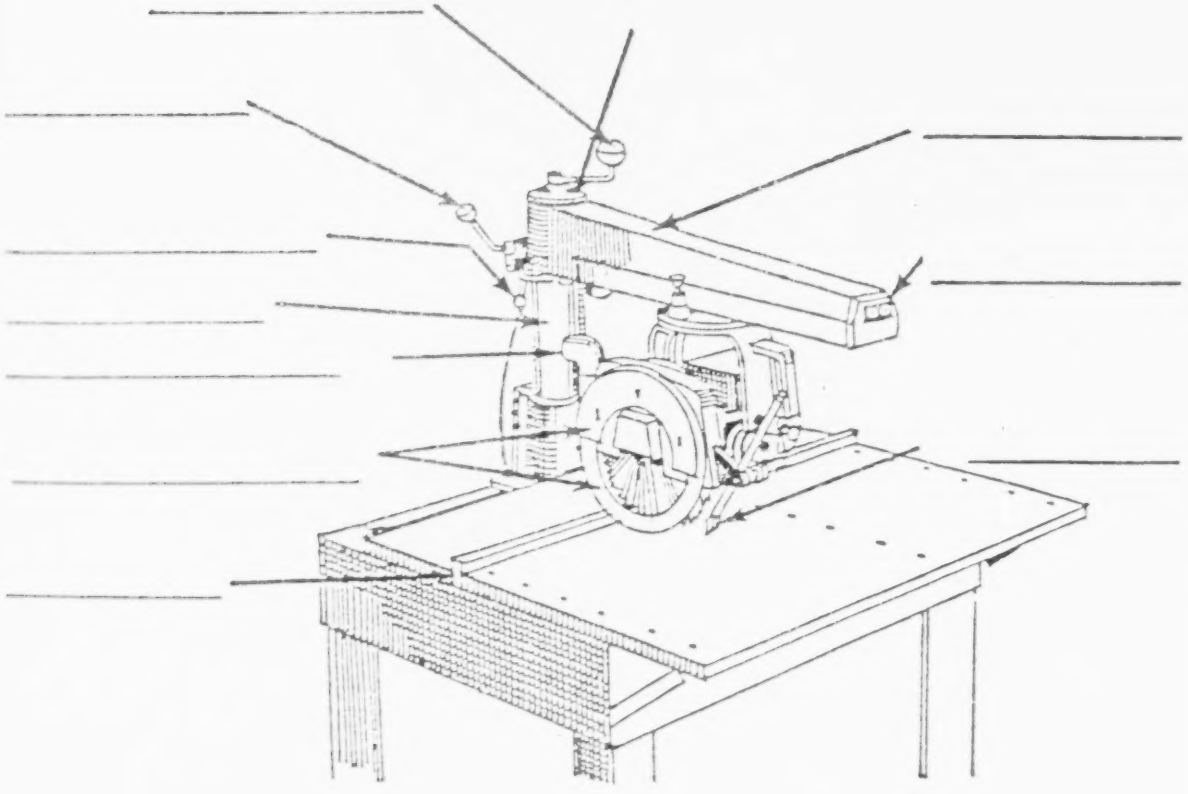
Student's Name_____
Class_____
Date _____ Grade_____

IDENTIFY MAJOR PARTS

Portable Circular Saw



Radial Arm Saw



Student's Name _____

Class _____

Date _____ Grade _____

IDENTIFY MAJOR PARTS

Scroll Saw

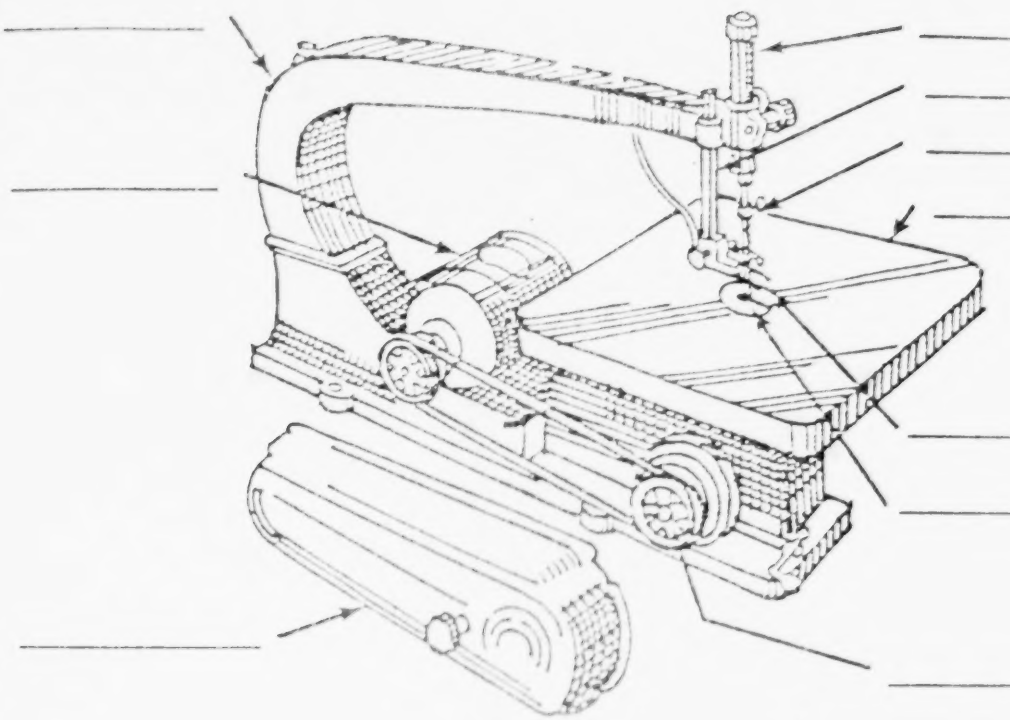
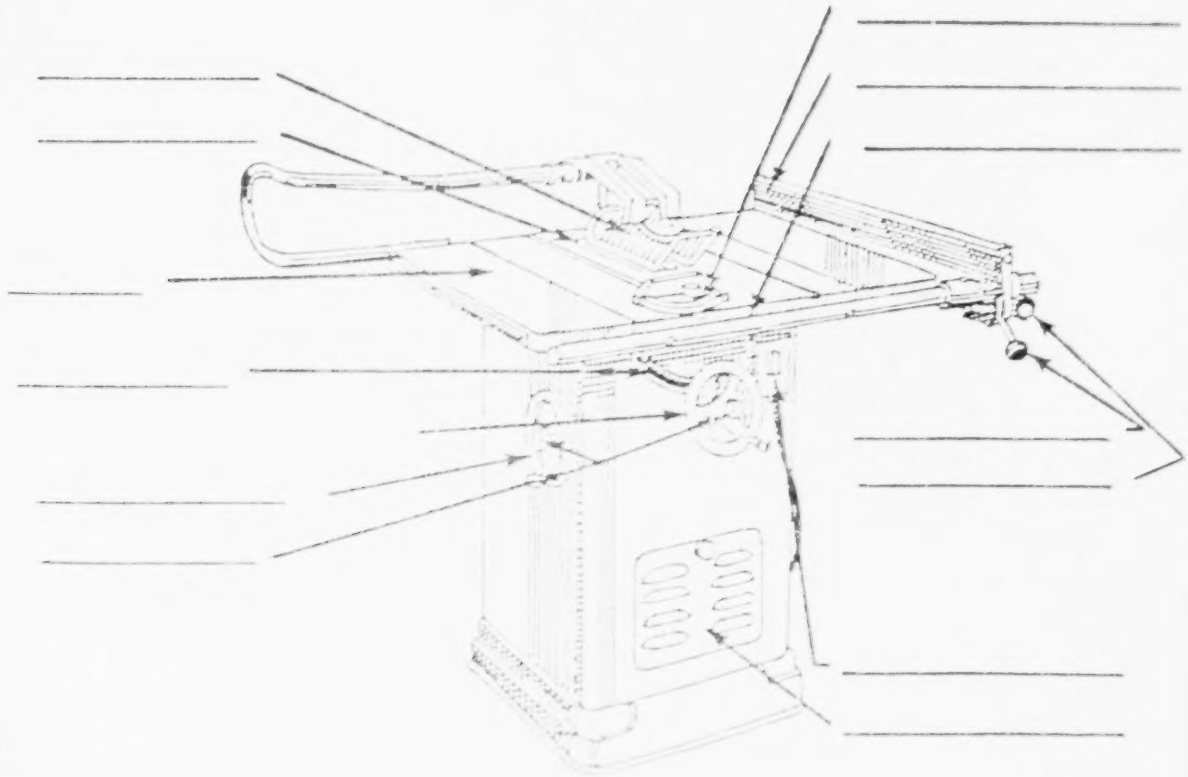


Table Saw



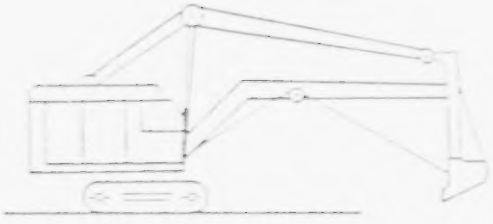
3. Pick

FIGURE 17

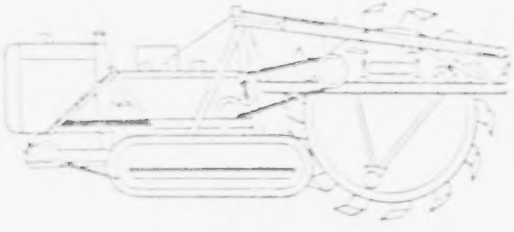
This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1985. page number 197

B. Power equipment — Used for different kinds of larger jobs

1. Backhoe



2. Trencher

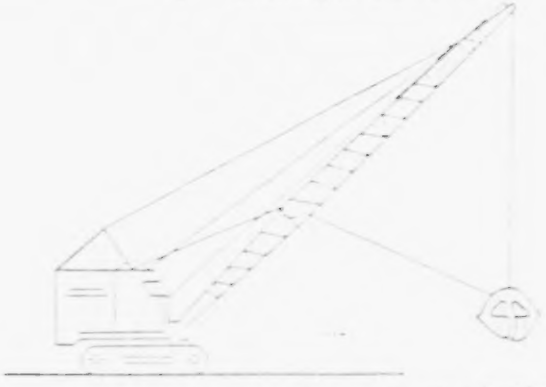


3. Bulldozer

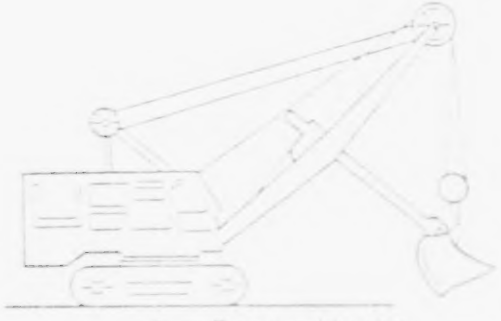
4. Scraper

From About Construction by Delmar Ltd., et al. Reprinted with permission of Bennett and McKnight Publishing Company.

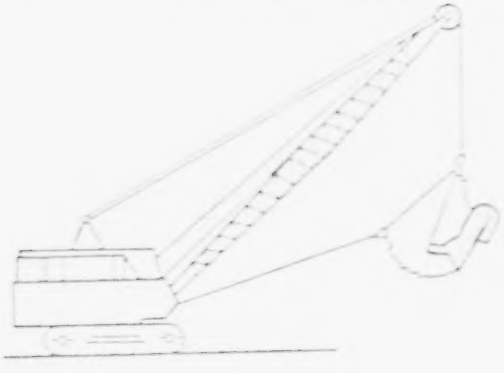
5. Crane with clamshell bucket



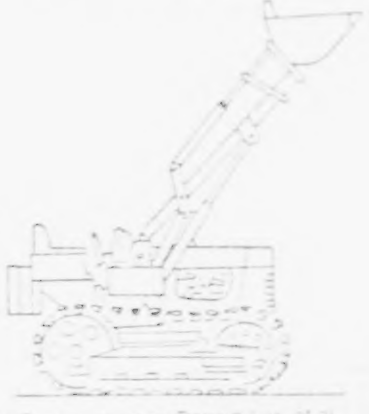
6. Power shovel



7. Crane with dragline bucket



8. Front-end loader



XI. Types of excavating

A. Rough excavating

1. Purpose of rough excavating — To remove large amounts of earth

2. Reasons for rough excavating

a. To reach earth that will provide a good base for the foundations of structures

b. To build basements of houses and other buildings

c. To make cuts through hills and for road beds

d. To smooth uneven ground

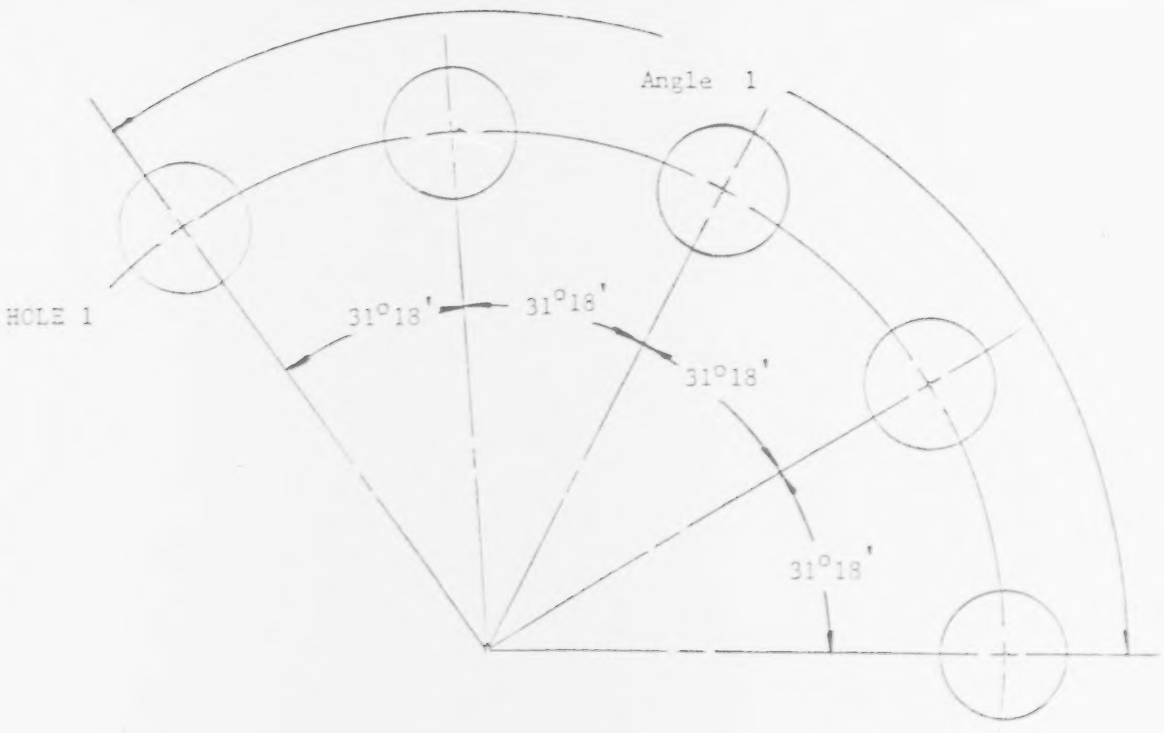
3. There are many ways to perform rough excavating such as trenching, dredging, and pit excavating depending on the specific reasons for excavating and special conditions that may exist.

From *World of Construction* by Donald Lux, et al. Reprinted with permission of Bennett and McKnight Publishing Company.

This copyrighted material is from the following source and is used by permission:
Pipelaying Construction Technology-Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 150

APPENDIX V

CONSTRUCTION MATHEMATICS



HOLE 5

Angle 1 = 4 x (31°18')

$$\begin{array}{r} 31^\circ 18' \\ \times\ 4 \\ \hline 124^\circ 72' \end{array}$$

Express 72' as degrees and minutes.
72' = 60' + 12' = 1°12'
Add.
124° + 1°12' = 125°12'

APPENDIX VI

SAFETY AND HEALTH IN CONSTRUCTION

OFFICES OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

Office of Information Services
Occupational Safety and Health Administration
U. S. Department of Labor
Washington, D. C. 20210

Regional Administrator
Occupational Safety and Health Administration
1375 Peachtree Street N.W., Suite 587
Atlanta, Georgia 30309 (404 526-3573)

These documents can be obtained from the Occupational Safety and Health Administration.

The Target Health Hazards, OSHA 2051

Trenching and Excavation--A Checklist, OSHA 2089

Selected Publications, OSHA 2019

Job Safety and Health, OSHA 2058

All About OSHA, OSHA 2056

Questions and Answers to Part 1910, OSHA 2095 Department of Labor

15 Questions, OSHA 2087

Know the Answers
Help Prevent Cave-ins

Excavating, Trenching and Backfilling, OSHA 2086

Inspection, OSHA 2026

Dangerous Cargo Labels, 1968: 0-321-482

Guidelines for Setting up Job Safety and Health Programs, OSHA 2072

The Target Industries, OSHA 2034

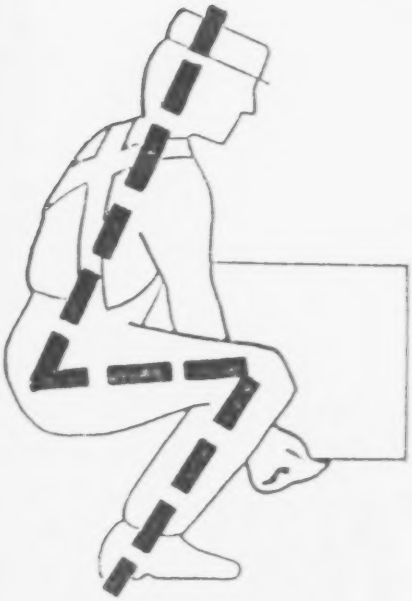
Profiles of Five Hazardous Occupations

Training Requirements of the Occupational Safety & Health Standards, OSHA 2082

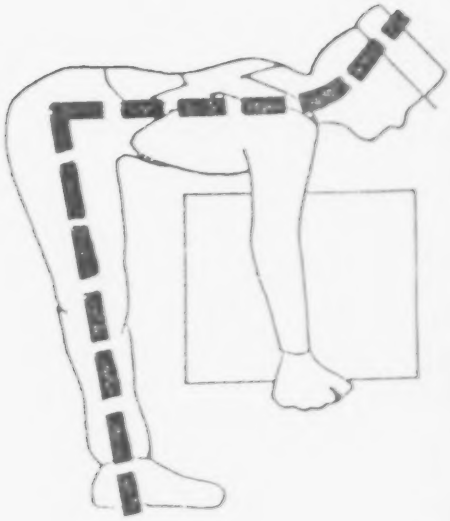
The Principles and Techniques of Mechanical Guarding, OSHA 2057

General Industry Guide for Applying Safety & Health Standards, OSHA 20 29CFR 1910

How to Lift Safely



LIFT THIS WAY



NOT THIS WAY

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 71

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 75

Proper Use of a Ladder

Check for broken or unsafe parts

Ladder ¼ length from wall

Use both hands

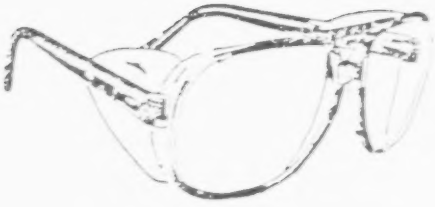
Never stand on top rungs

Open stepladder fully

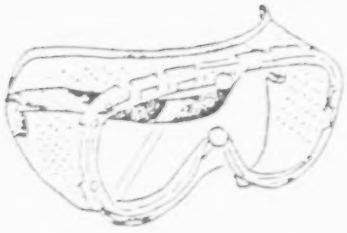
Face ladder when going up or down—never jump off

Only one person on a ladder

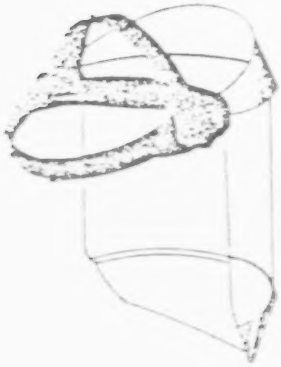
Safety Equipment



Safety Glasses
(with Sideshields)



Safety Goggles
(perforated frames)



Face Shield

Welding Helmet

Gloves

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 67

Safety Equipment

(Continued)

Ear Plugs

Ear Muffs

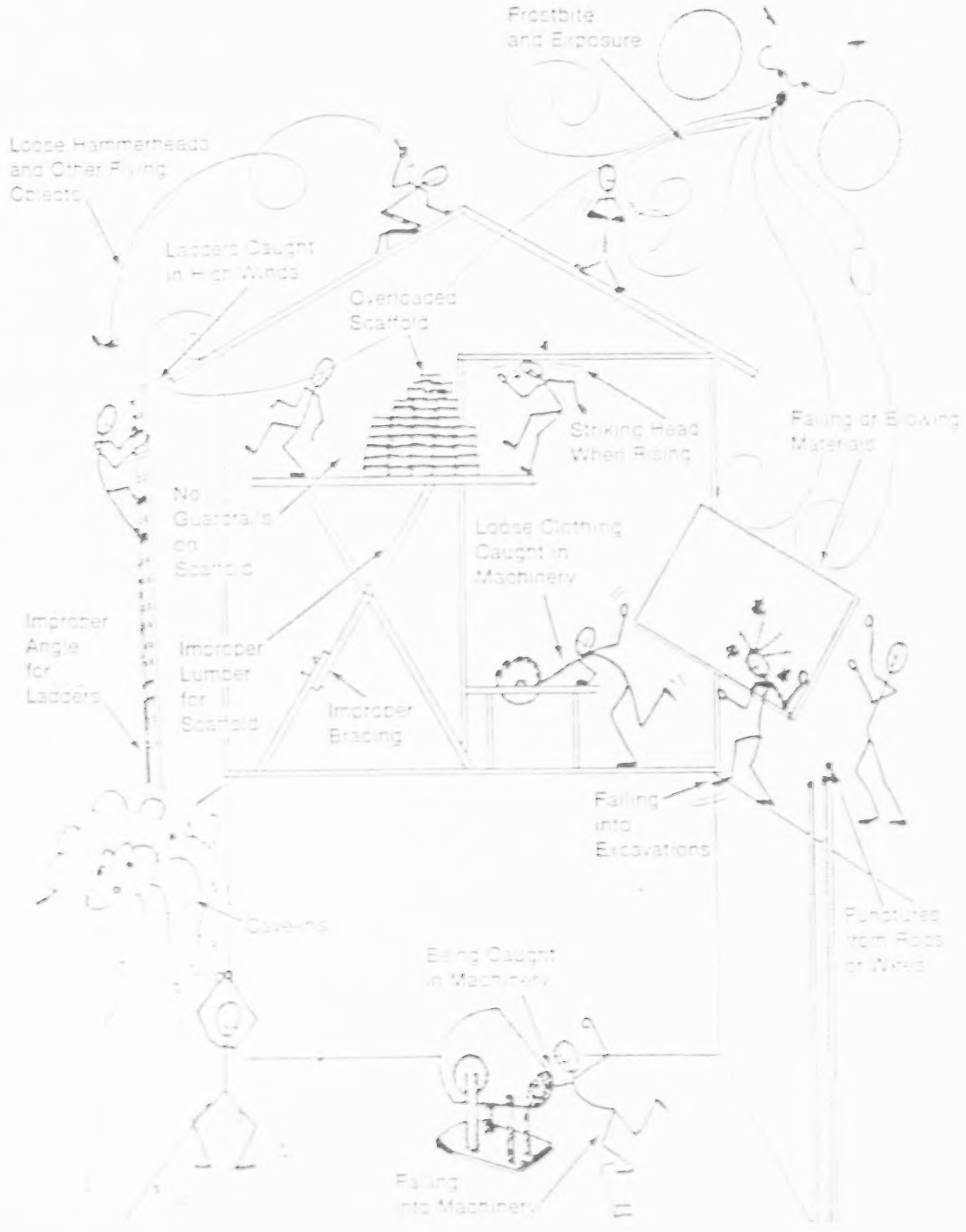
Hearing Protection

Safety Hat

Steel-Toed Safety Shoes and Boots

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 69

Safety Hazards at the Site



This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 63

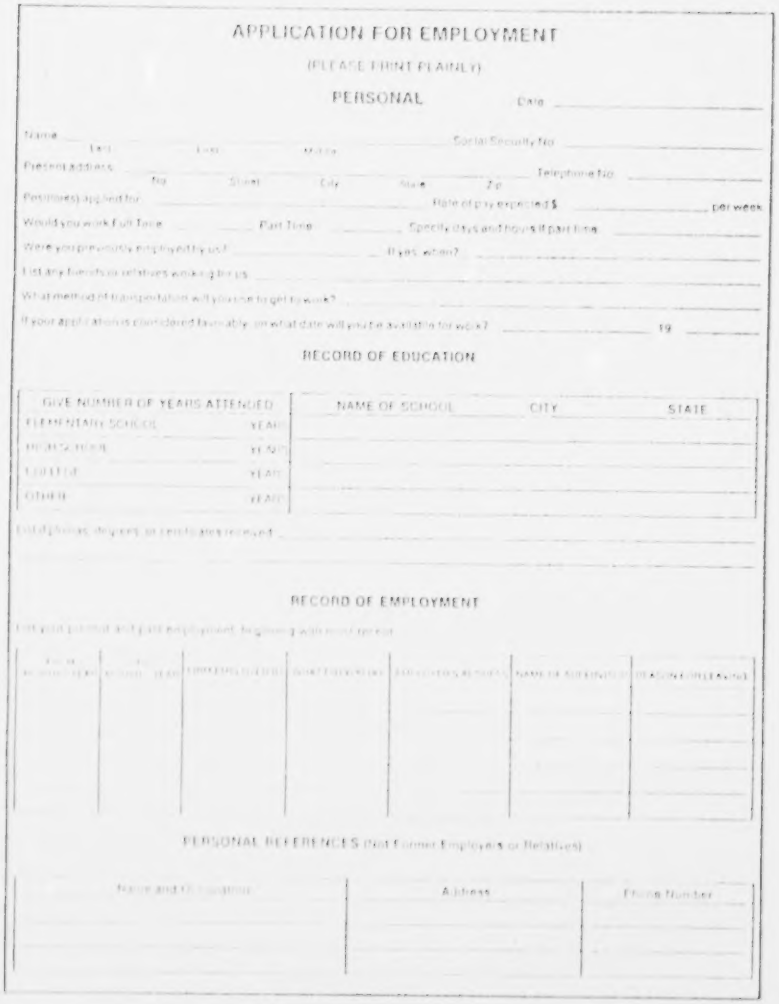
Safety Hazards at the Site

(Continued)

This copyrighted material is from the following source and is used by permission:
Interior Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 65

APPENDIX VII

PRE-CONSTRUCTION PLANNING



APPLICATION FOR EMPLOYMENT

(PLEASE PRINT PLAINLY)

PERSONAL Date

Name Last First Middle Social Security No.

Present address No. Street City State Zip Telephone No.

Position(s) applied for Rate of pay expected $ per week

Would you work Full Time Part Time Specify days and hours if part time

Were you previously employed by us? If yes, when?

List any friends or relatives working for us

What method of transportation will you use to get to work?

If your application is considered favorably on what date will you be available for work? 19

RECORD OF EDUCATION

GIVE NUMBER OF YEARS ATTENDED	NAME OF SCHOOL	CITY	STATE
ELEMENTARY SCHOOL YEARS			
HIGH SCHOOL YEARS			
COLLEGE YEARS			
OTHER YEARS			

Subjects you have taken or skills you have learned

RECORD OF EMPLOYMENT

List your present and past employment, beginning with most recent

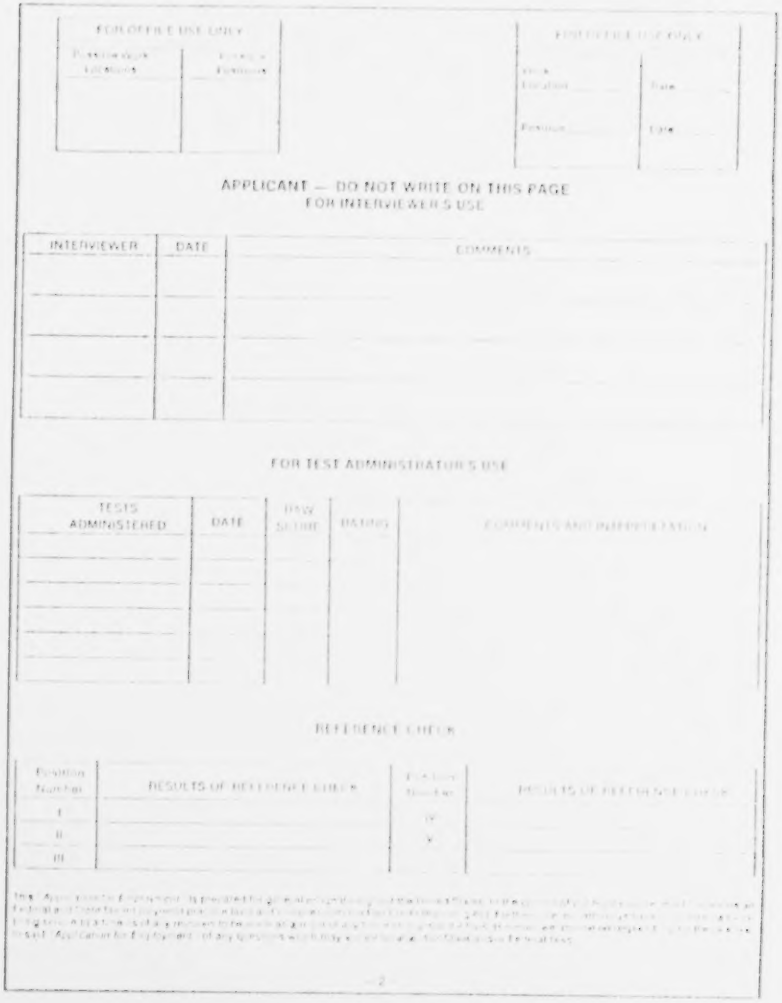
From Month Year	To Month Year	Name and Address of Employer	Kind of Business	Your Position(s)	Name of Supervisor	Reason for Leaving

PERSONAL REFERENCES (Not Former Employers or Relatives)

Name and Occupation	Address	Phone Number

Fig. 25-3

To place the right workers in the right jobs, employers need information about applicants.



FOR OFFICE USE ONLY

Position Applied For | Salary Expected

FOR OFFICE USE ONLY

Rate Date

Location

Position Type

APPLICANT — DO NOT WRITE ON THIS PAGE
FOR INTERVIEWER'S USE

INTERVIEWER	DATE	COMMENTS

FOR TEST ADMINISTRATOR'S USE

TESTS ADMINISTERED	DATE	RAW SCORE	RATING	COMMENTS AND INTERPRETATION

REFERENCE CHECK

Position Number	RESULTS OF REFERENCE CHECK	Position Number	RESULTS OF REFERENCE CHECK
I		IV	
II		V	
III			

This Application Form is the property of the Company and may be withdrawn or rejected at any time without notice or explanation. Employment is subject to satisfactory physical examination. Application for employment does not obligate the Company to employ the applicant. Any misrepresentation or omission of facts called for in this application will be sufficient cause for dismissal if employment is secured.

—2—

Fig. 25-4

On part of the application form, information about the applicant is recorded by the interviewer.

This copyrighted material is from the following textbook and is used by permission:
Lux, Donald G., et al.
The World of Construction.
Bloomington, Illinois:
McKnight Publishing Co.,
1982.

BEST COPY AVAILABLE

APPENDIX VIII

CONSTRUCTION PROCESSES AND PRODUCTION

Calculating Earthmoving Costs

Today you will solve some earthmoving problems. You will estimate some costs.

This copyrighted material is from the following workbook and is used by permission: Lux, Donald G., et al., The World of Construction, Bloomington, Illinois: McKnight Publishing Co., 1992.

Problem

Objectives

1. Figure the amount of earth moved per hour.
2. Select the most efficient earthmoving equipment.
3. Figure the equipment costs.

Equipment (per student)

1 12" rule

Reviewing the Problem

Situation

A contract has been received for an earthmoving job. The job requires leveling a 100-acre pasture for a highway.

1. Leveling the site requires two machines. A bulldozer will be used for minor leveling. A scraper will be used for major leveling. Then, a front-end loader is used to load excess soil. A truck will carry this soil away.
2. You must decide what size scraper and what size bulldozer to use. You will base these decisions on equipment efficiency. That is, which equipment will do the work for the lowest cost? You will figure only the cost for one cut or pass. This means removing one layer of earth from the 100-acre tract.

Determining Acres Moved Per Hour

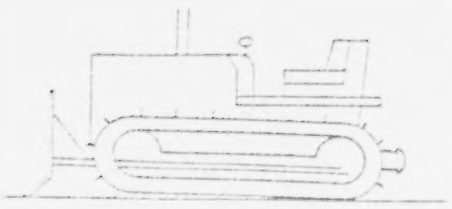
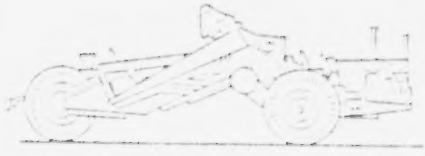
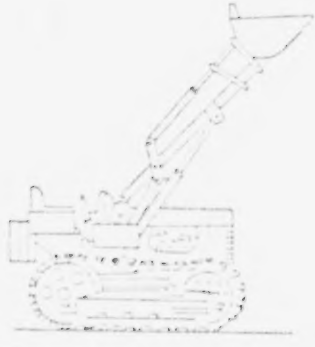
3. Study Fig. 99-1. Look at columns A, B, and C. Column A gives the width of the blade cut in feet. Column B gives the equipment speed in miles per hour.

Figure 99-2 shows four pieces of equipment, their uses, and the cost per hour of using each type. Various blade sizes are listed in the problems in Fig. 99-1. You will determine the acres of land each piece of equipment can move in one hour.

Fig. 99-1
Efficiency Chart

Equipment	Problem	A Width of Cut (in feet)	B Speed (in miles per hour)	C Area (in acres per hour)	D Number of Hours	E Equipment Cost/Hr.	F Total Cost	G Cost of Most Efficient
Example	1	4	7	2.8	39	$35	$1365	
Bulldozer: Minor leveling and excavating	2	6	6					
	3	7	3					
	4	8	5					
	5	9	4					
Scraper: Major leveling and excavating	1	3	7					
	2	4	6					
	3	5	4					
	4	6	5					
	5	7	3					
Front-end loader: Excess dirt loaded into trucks								
Truck: Excess earth transported from site								
						Total Equipment Cost		

Fig. 99-2
Equipment Uses and Costs

Equipment	Main Uses	Cost Per Hour
Tractor with Dozer Blade 	Shallow digging Digging to depth Short haul scraper operations Transferring	$35
Scraper Pan 	Leveling operation Excavation	$40
Front-End Loader 	Shallow digging Digging to depth Short haul scraper operations Loading trucks	$35
Dump Truck	Transferring material from excavation site to disposal site	$20

4. Look at Fig. 99-3, columns A, B, and C. Column A gives speed in miles per hour. Column B gives area in acres per hour. Column C gives width of cut in feet.
5. For each problem, refer to Fig. 99-1 and find the bulldozer width of cut (column A). Then find the speed in miles per hour (column B). Now, in column C of Fig. 99-3, mark the width of cut you found. Then mark the speed in column A of Fig. 99-3. Using a rule, draw a straight line between these two points. Then read the number shown on the spot where the line crossed column B.
6. Record the area in column C of Fig. 99-1.
7. Repeat steps 5 and 6 to find the acres of earth moved by each bulldozer and scraper.

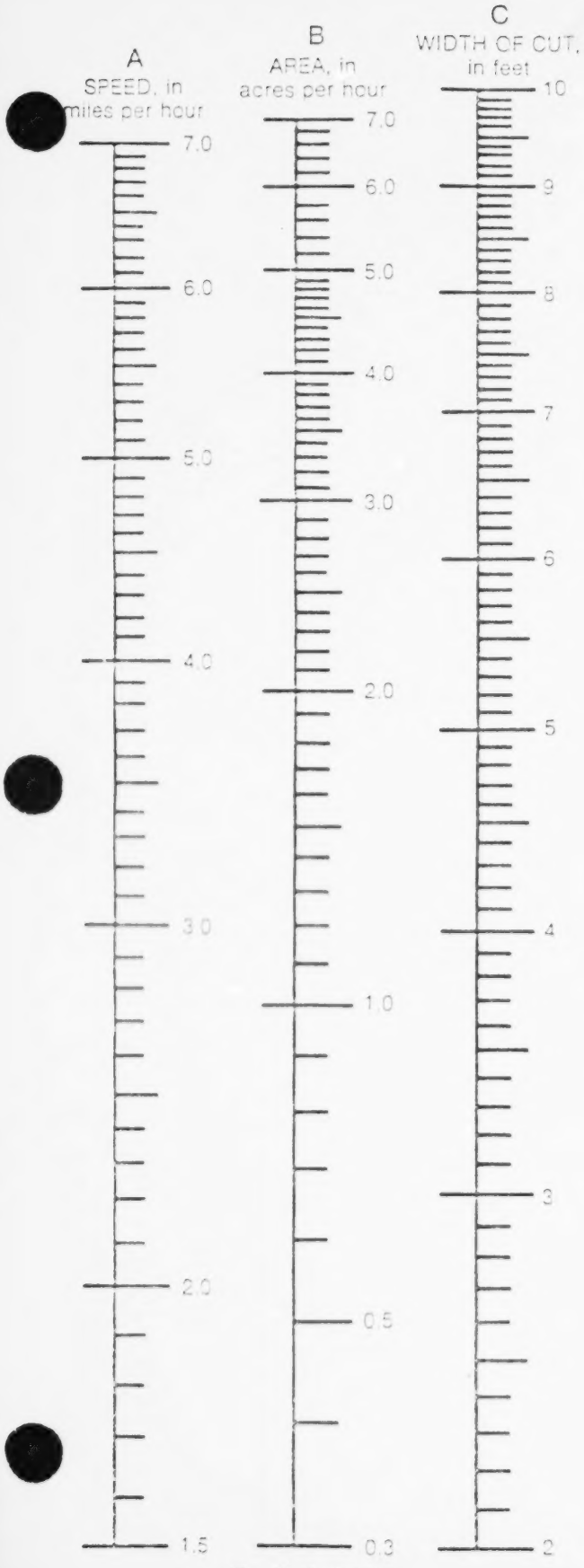


Fig. 99-3 Graph

Fig. 99-4

Hours

Area in Acres Per Hour	Number of Hours Needed
2.0	50
2.1	48
2.4	42
2.8	39
3.0	33
3.6	28
4.0	25

8. See Fig. 99-4. Find the number of hours each piece of equipment is needed. Enter the number of hours in column D, Fig. 99-1.

Determining Costs

9. See Fig. 99-2. Find the cost per hour for the bulldozers and scrapers. Enter these figures in column E, Fig. 99-1.
10. In Fig. 99-1, find the total cost (column F). Do this by multiplying the number of hours (D) by the equipment cost (E). Enter this figure in column F. Do this for each piece of equipment.
11. Compare the bulldozer costs. Record the lowest cost in column G. This figure represents the most efficient bulldozer. Follow the same procedure to find the most efficient scraper.

Determining Truck and Loader Costs

12. Excess soil must be loaded and carried away. A truck and front-end loader will be used. They must be on the site when the bulldozer and scraper are operating.
13. The truck and end loader will be used with the bulldozer and scraper. Find the number of hours the most efficient bulldozer and the most efficient scraper are needed. Record the higher of these two figures in column D, across from "Front-end loader." Also record this number across from "Truck," again in column D.
14. Refer to Fig. 99-2 to find the equipment cost for the truck and loader. See Fig. 99-2. Enter these costs in column E.
15. Multiply the number of hours (D) by the equipment cost (E) to find each total cost. Record the figures in columns F and G.
16. Add all four figures in column G to find the total equipment cost. This sum is the cost of the least expensive way to do the work.

Cleaning Up

17. Collect and store the Laboratory Manuals.

This copyrighted material is from the following workbook and is used by permission: Lux, Donald G., et al. The World of Construction. Bloomington, Illinois: McKnight Publishing Co., 1982.

Building Permit

Bldg. Permit No. _____ Elec. Permit No. _____

Plbg. Permit No. _____ Date Issued _____

Street Address _____ Lot _____ Block _____

General Contractor's Name _____ Phone _____

Address _____

	REJECTED	ACCEPTED
BUILDING		
1st Inspection: Foundations		
2nd Inspection: Drywall		
3rd Inspection: For Occupancy Permit		
For Building Inspections Call _ _ _ - _ _ _ _		
PLUMBING		
Plumbing Contractor:		
1st Inspection: Exterior Rough-In		
2nd Inspection: Drywall		
3rd Inspection: Final		
For Plumbing Inspections Call _ _ _ - _ _ _ _		
ELECTRICAL		
Electrical Contractor		
1st Inspection: Drywall		
2nd Inspection for Occupancy Permit		
For Electrical Inspections Call _ _ _ - _ _ _ _		
PUBLIC WORKS INSP. CALL _ _ _ - _ _ _ _		
SEWER TAP—SEWER LINES & DRAIN LINES INSP. CALL _ _ _ - _ _ _ _		
WATER TAP—CALL _ _ _ - _ _ _ _		
HEATING—For Inspections Call _ _ _ - _ _ _ _		
REFRIGERATION (Permit Required) For Inspections Call _ _ _ - _ _ _ _		

NOTICE!

(1) The approval of the drawings will not sanction nor permit any violation of village zoning or building code.
(2) A complete set of approved drawings along with permit must be kept on the premises during construction.
(3) The permit will become null and void in the event of any deviation from the accepted drawings.
(4) No foundation, structural, electrical, nor plumbing work shall be concealed without approval.
(5) The building may not be occupied or used for storage without first obtaining an occupancy permit.

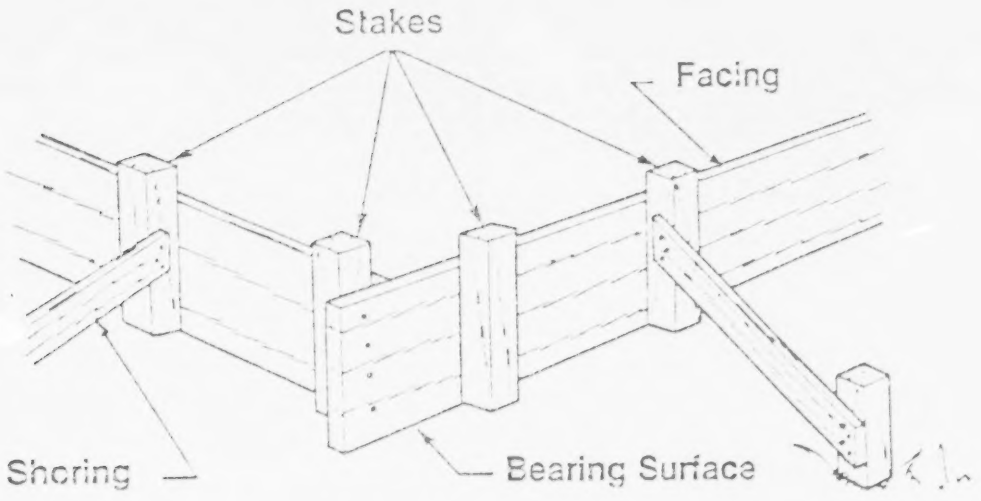
No work shall be done on any part of the building beyond the point indicated in each successive inspection without acceptance. No structural framework of any part of any building or any underground work shall be covered or concealed without acceptance.

THIS PERMIT MUST BE PROMINENTLY DISPLAYED ON BUILDING AT ALL TIMES

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987, page number 119

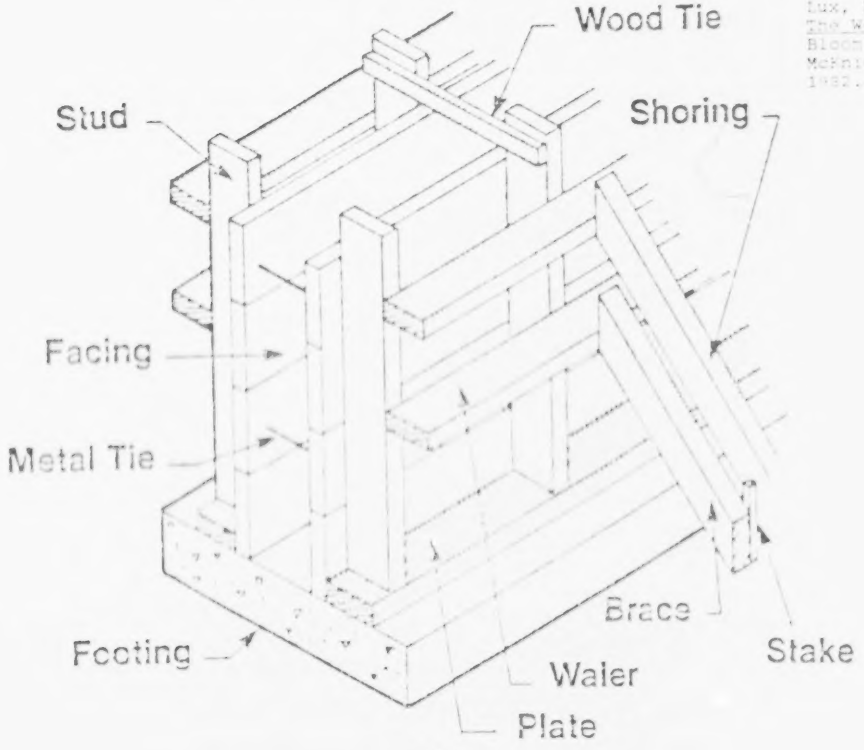
BEST COPY AVAILABLE

Foundation Forms



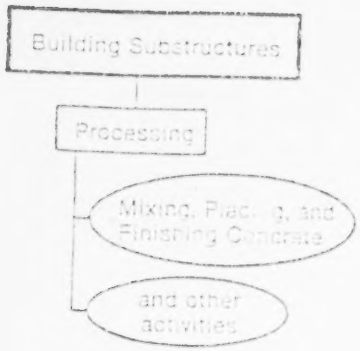
Slab Foundation

This copyrighted material is from the following workbook and is used by permission:
Lux, Donald G., et al.
The World of Construction.
Bloomington, Il. 1982:
McKnight Publishing Co., 1982.



Foundation Wall

Mixing, Placing, and Finishing Concrete



In the first class period, your teacher will demonstrate practices of mixing, placing, and finishing concrete. During the next class period, you will do these things. When you work with concrete, mix it carefully. This will improve the finished product.

Activity 1

Objectives

1. Proportion, mix, and test concrete.
2. Place, rod, strike off, and finish concrete.

Equipment (per class)

1 mortar box (for mixing concrete)
1 wheelbarrow
1 hoe or shovel

Equipment (per group)

1 wood straightedge, 1 × 3 × 18"
1 steel cement finishing trowel
1 8 oz. measuring cup
1 steel rod, 2', or scrap stick, 1 × 1 × 2'
1 edger

Supplies (per group)

1 footing form, 3" × 12" × 12" (from Activity 104)
1 16 oz. paper cup (slump test mold)
3 cups cement
9 cups sand
12 cups gravel
1 large plastic sheet or building felt

Safety Precautions

- Eyes may be irritated by cement. Wear safety goggles.
- Do not inhale dust from dry cement. Wear dust mask while sweeping.
- Keep hands out of wet cement as much as possible. Skin may become irritated.

Preparing to Work

1. Check to see if your form has been treated with release agent.
2. Check to see if the form is nailed securely.
3. Spread the plastic sheet or building felt under your form.
4. Check with your teacher about your turn for mixing.
5. Place the following materials in the mortar box:
   12 cups gravel
   9 cups sand
   3 cups cement
6. Thoroughly dry-mix the concrete with the hoe or shovel.
7. Add one cup of water. Wet-mix.
8. Make a slump test. See Fig. 108-1. The concrete should slump about one-third the height of the cone. If it does not, add a little more water. Mix and test again.
9. Add water until the slump is correct. Remix the materials briefly. Shovel the mix into a wheelbarrow.

Placing Concrete

10. Place the concrete into your form. Return the wheelbarrow to the mixing box.
11. Rod the concrete to work it in between the reinforcement. Important: Rod the concrete along the edges of the form. This will give a smooth edge finish.

Fig. 108-1
A slump test cone.

This illustrated material is from the following workbook and is used by permission: Fox, Donald G., et al. The World of Construction. Bloomington, Illinois: McKnight Publishing Co., 1982.

BEST COPY AVAILABLE

CONCRETE TECHNOLOGY (SLUMP TEST)

This copyrighted material is from the following laboratory manual and is used by permission:
Landers, Jack M. Construction: Materials, Methods, Careers. South Holland, Illinois: Goodheart-Willcox Co., Inc., 1981.

Developed by the Romans around 100 years BC, concrete has long been a basic construction material. Today, it is used for foundations, highways, bridges, sidewalks, hydroelectric dams, tall buildings and park benches. Concrete consists of sand and aggregates of gravel, cement and water.

OBJECTIVE

Given the necessary materials, the student will be able to conduct a slump test on concrete.

EQUIPMENT AND MATERIAL

Slump pan.
Slump cone.
Bullet nose tamping rod, 5/8 in.
Measuring rule.
Course aggregate, 20 lb.
Fine aggregate, 18 lb.
Cement, 8 lb.
Water, 3 lb.

SUGGESTED READING ASSIGNMENT

Chapter 20 (text).

ACTIVITY PROCEDURE

1. Mix enough concrete to fill a standard slump cone 12 in. high by 8 in. in diameter, at the bottom. Use a 1:3:4 mix, one part cement, three parts sand, four parts aggregate. Add enough water to this dry mix to make the concrete slump from 3 to 6 in.
2. Fill the slump cone in three equal layers, each being rodded 25 times with the 5/8 in. bullet nose tamping rod.
3. When the cone is filled and leveled off, lift carefully.
4. Measure the amount of slump, Fig. 22-1.

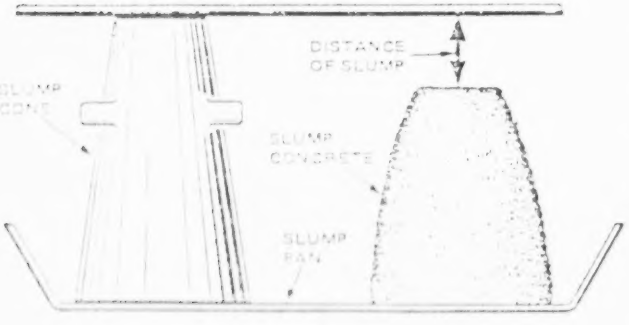


Fig. 22-1. Measuring amount of slump in concrete.

EVALUATION

1. What effect does water have on concrete?

2. What amount of slump should be used for:
   concrete slabs

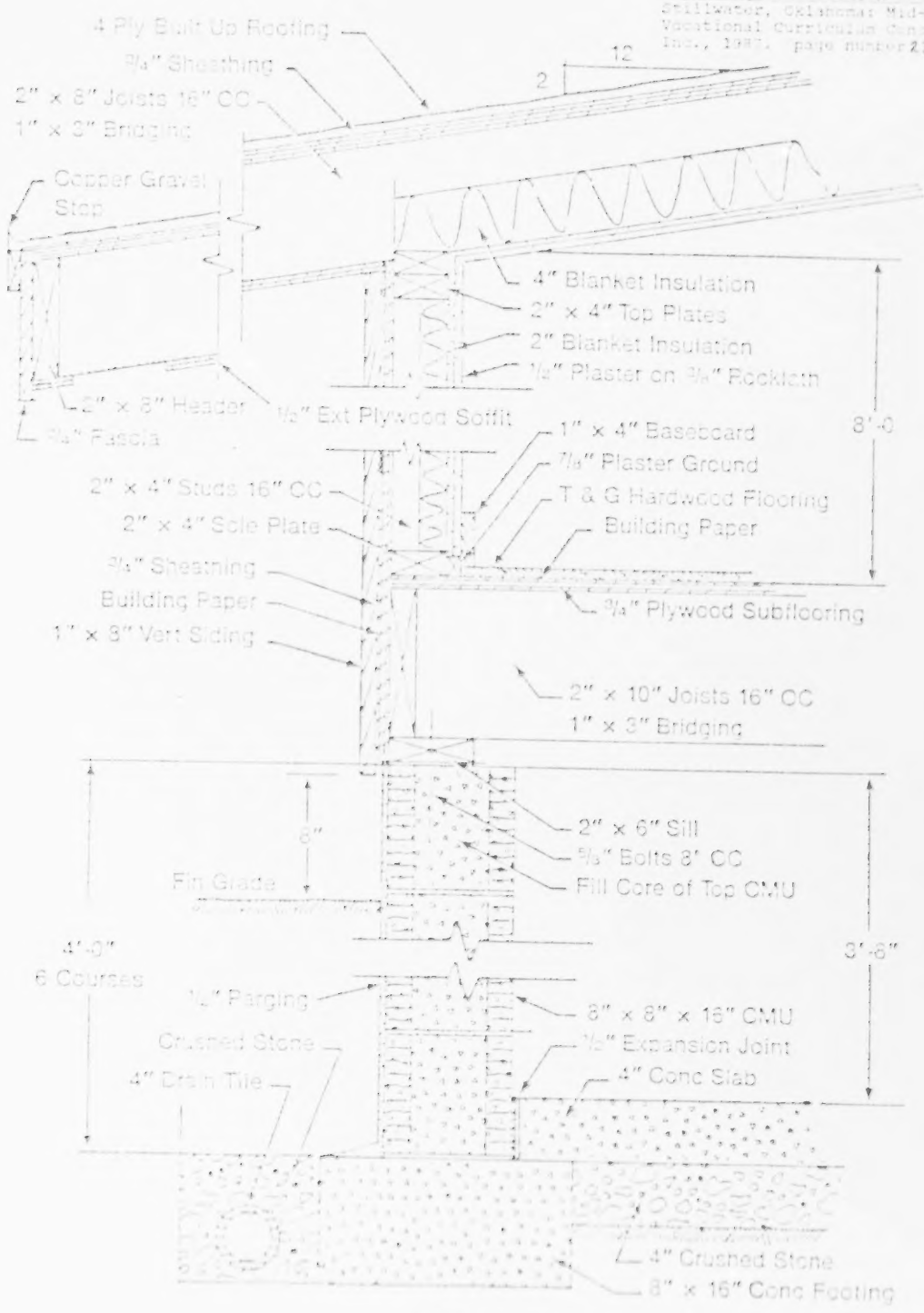
   thin walls

   reinforced walls

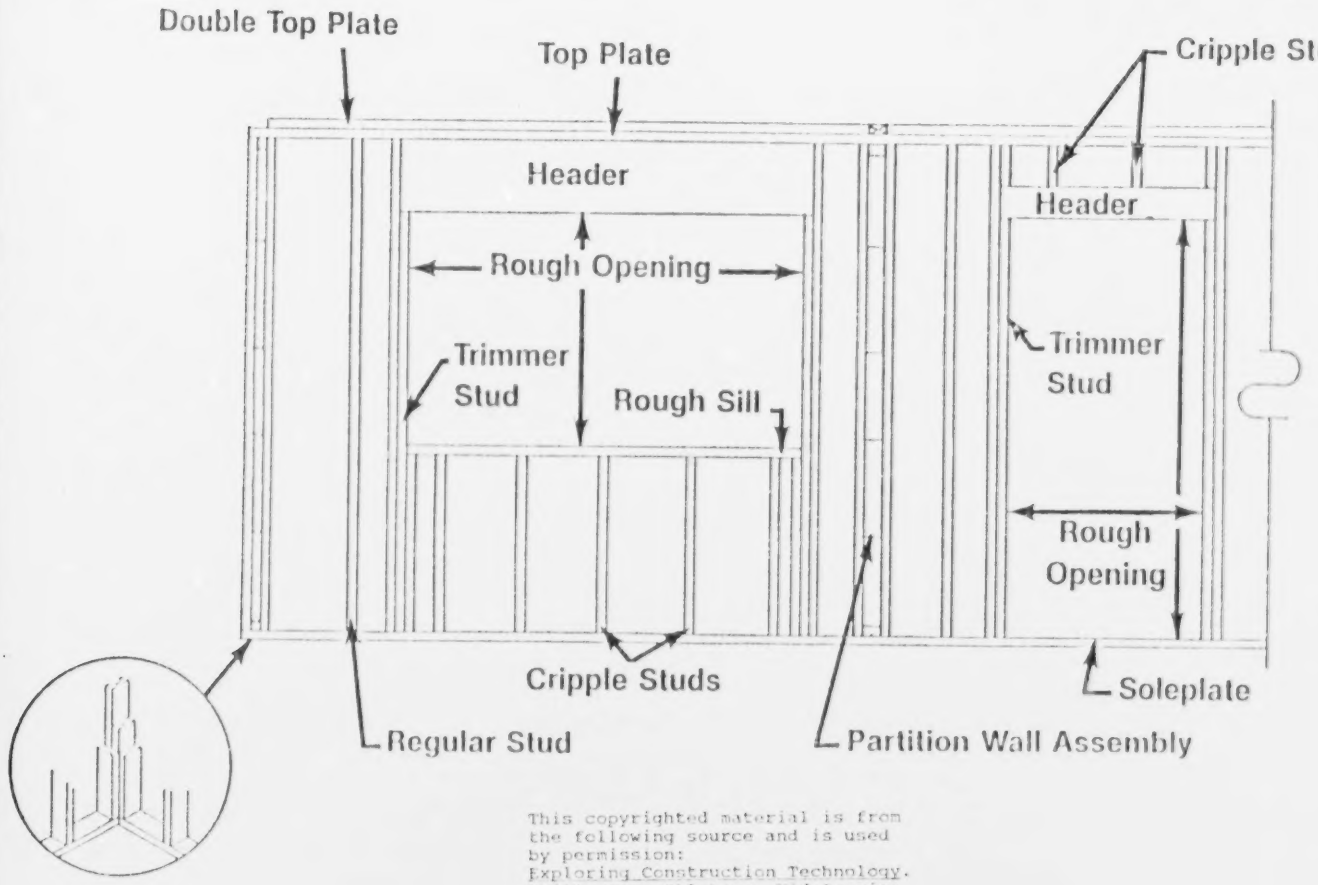
3. Why was the concrete rodded?

Cross Section of a Structure

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Chelmsford, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1983. page number 231

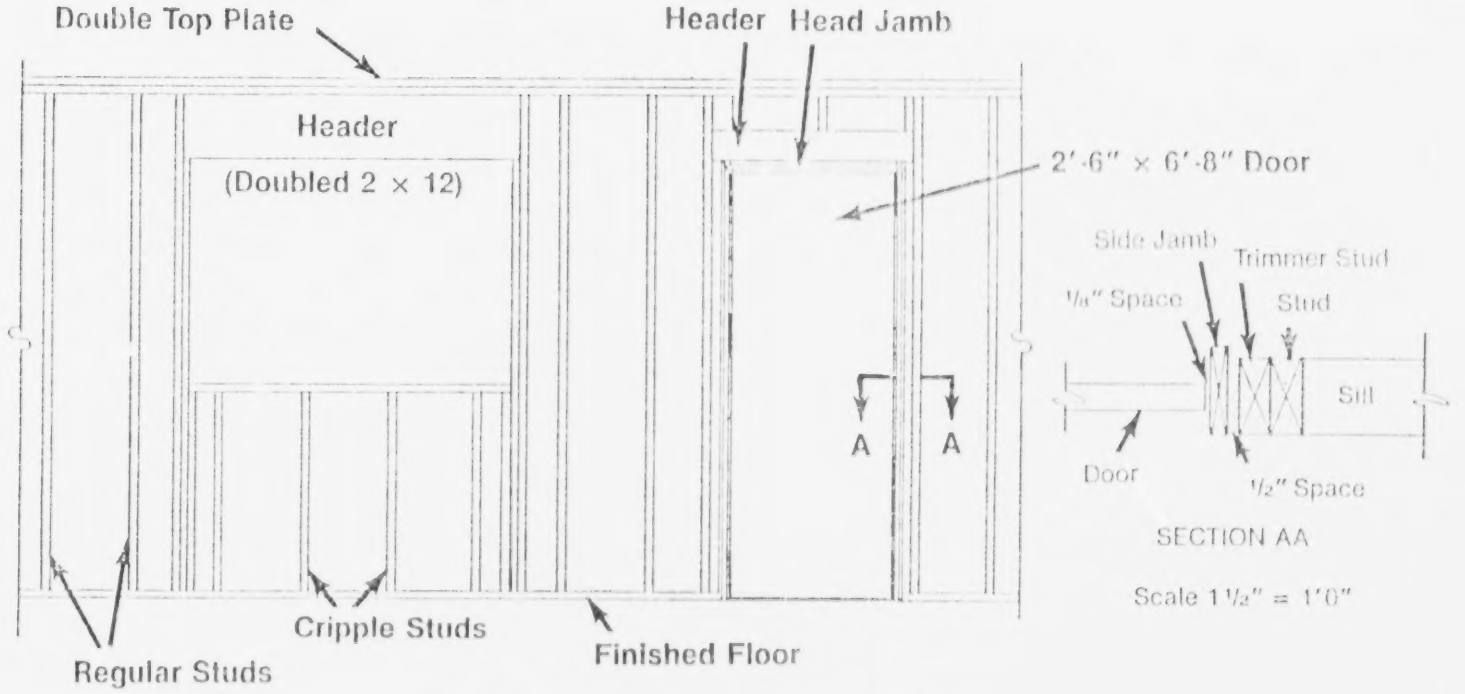


Wall and Partition Framing Members



This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 235

Door and Window Headers



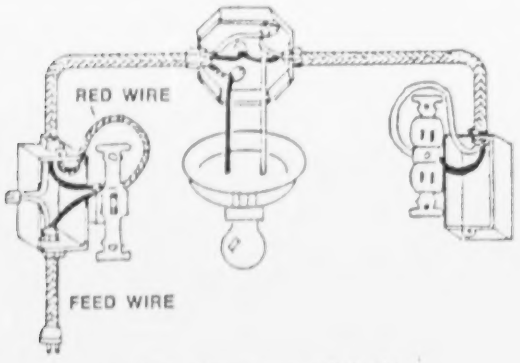
Scale: ⅜" = 1'-0"

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. [illegible] number 235

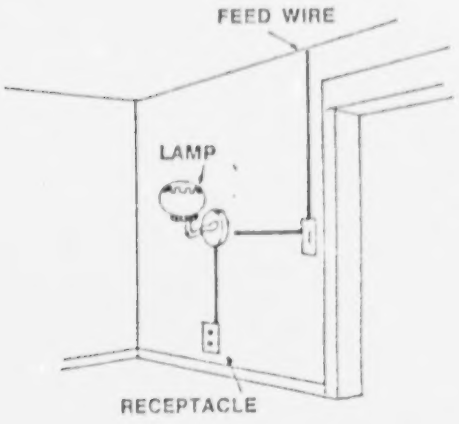
103

WIRING A SWITCH, LAMP, AND RECEPTACLE CIRCUIT

In this activity you will make an electrical circuit with a switch, light, and receptacle. Fig. 19-61.



A. The circuit you will build.



B. The circuit in a structure.

Fig. 19-61. This is a pictorial illustration of circuit

EQUIPMENT AND SUPPLIES (PG4S)

1 plug
2 single square outlet boxes
1 hexagon outlet box
1 single-pole switch
1 lamp holder
1 duplex receptacle
5 connectors
4 wire nuts
#12 (2.0 mm) two wire sheathed cable
#12 (2.0 mm) three wire sheathed cable
6″ #12 black electrical wire
(15.2 cm of 2.0 mm wire)
6″ #12 white electrical wire
(15.2 cm of 2.0 mm wire)
2 screwdrivers
1 pair long-nose pliers
1 knife or wire stripper
1 light bulb (low wattage)
6 nails or screws
1 small appliance or receptacle tester

REVIEW THE ELECTRICAL PLAN

Study Fig. 19-62 to locate all of the supplies. The following code identifies each item:

A. steel boxes for switch and receptacle
B. single-pole, single-throw switch
C. five connectors
D. four wire nuts

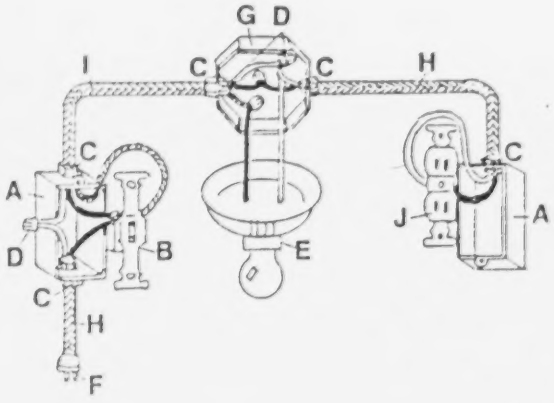


Fig. 19-62. Location of all electrical items needed

This copyrighted material is from the following textbook and is used by permission:
Betts, M. Roger, et al. Exploring the Construction Industry.
Bloomington, Illinois: McKnight Publishing co., 1976.

APPENDIX IX

CONSTRUCTION COMPLETION

PROJECT COMPLETION

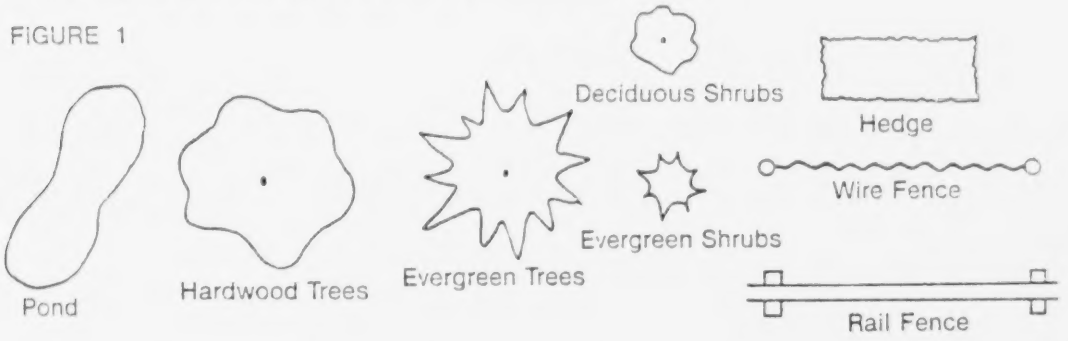
ASSIGNMENT SHEET #1 — MAKE A LANDSCAPE PLAN

NAME _____ SCORE _____

NAME _____ SCORE _____

Direction: All landscaping work begins with a plan. In this assignment you are to work in teams and make a landscape plan. Use the landscape symbols below.

FIGURE 1



1. Identify a lead architect in your group. (You may wish to name your firm.)

2. Identify the project.

   Examples: a. If you built an actual structure, plan a landscape for it.
   b. Develop a landscape plan for an area around your school.
   c. Develop a plan to landscape the site box.

3. Develop ideas by brainstorming alternatives.

   (NOTE: Remember the rules of brainstorming.)

   a. All ideas are good.

   b. Make no judgment until brainstorming is over.

   c. The more ideas, the better.

   d. Build on other ideas.

4. Refine your ideas to produce the final idea.

5. Analyze your ideas to make sure they work.

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 315

ASSIGNMENT SHEET

6. Select the best idea.

7. Implement the idea by making a finished drawing on grid paper provided by your instructor.

   (NOTE: Make your drawing to ¼ scale [¼" = 1'].)

8. Turn in your final plan to your instructor.

Evaluation criteria

1. Was the site appearance improved?

2. Will the site's living environment be improved?

3. Will the landscape design assist in conserving energy?

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 316

PROJECT COMPLETION

ASSIGNMENT SHEET #2 — MAKE FINAL INSPECTIONS

NAME _____ SCORE _____

Directions: The construction superintendent or your instructor will assign inspection roles and tell you which of the following checklist(s) to complete:

1. Project designer's inspection checklist
2. Owner's inspection checklist
3. Building inspector's inspection checklist
4. Lender's inspection checklist

After completing the checklist, fill out the Punch List and give it to the contractor. Each item should be corrected, negotiated, or explained to the person in authority.

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 317

ASSIGNMENT SHEET

PROJECT DESIGNER'S INSPECTION CHECKLIST

Use the inspection checklist below. It will help you to check each item. You may add items to be checked if needed. The items that pass inspection are checked under the S (Satisfactory). Those that do not pass are checked under the U (Unsatisfactory). Make a list of the unsatisfactory items on the PUNCH LIST.

	S	U
1. Is the roofing put on according to the drawings?		
2. Do the exterior wall coverings meet specifications? a. Siding b. Trim c. Window d. Door		
3. Are all cracks sealed? a. Correct moldings b. Correct caulking c. Neatly installed		
4. Was the specified paint used and applied correctly? a. Type b. Color c. Method		
5. Were the same materials that were specified correctly installed? a. Ceiling b. Walls c. Floors		
6. Was the electrical circuit and devices installed according to specifications? a. Switch b. Outlet c. Light d. Conductors		
7. Were the specified materials used and were pipes installed correctly? a. DWV b. Hot water c. Cold water d. Gas e. Sink		
8. Was the doorbell that was specified used?		

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 321

ASSIGNMENT SHEET

OWNER'S INSPECTION CHECKLIST

Use the inspection checklist below. It will help you to check each item. You may add items to be checked if needed. The items that pass inspection are checked under the S (Satisfactory). Those that do not pass are checked under the U (Unsatisfactory). Make a list of the unsatisfactory items on the PUNCH LIST.

	S	U
1. Were roofing materials put on correctly and neatly?		
2. Was the exterior wall surface installed correctly and neatly?		
a. Siding		
b. Trim		
c. Window		
3. Are all cracks sealed?		
a. Neatly done		
b. Correct materials		
c. Infiltration of air kept to a minimum		
4. Was the painted exterior surface painted correctly?		
a. Correct type of paint		
b. Right color		
c. Painting Technique		
5. Were the materials used to finish the interior surfaces properly installed?		
a. Ceiling		
b. Walls		
c. Floors		
6. Do the electrical circuits work?		
a. Switch		
b. Outlet		
c. Light		
7. Are the plumbing fixtures installed in the correct place and do they work?		
a. DWV		
b. Hot water		
c. Cold water		
d. Gas		
e. Sink		
8. Does the doorbell work?		

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 325

ASSIGNMENT SHEET

BUILDING INSPECTOR'S INSPECTION CHECKLIST

Use the inspection checklist below. It will help you to check each item. You may add items to be checked if needed. The items that pass inspection are checked under the S (Satisfactory). Those that do not pass are checked under the U (Unsatisfactory). Make a list of the unsatisfactory items on the PUNCH LIST.

	S	U
1. Does the roofing material meet fire codes?		
2. Do wall coverings meet fire codes? a. Siding b. Trim c. Window d. Door		
3. Are all cracks sealed so insects and birds cannot enter? a. Around door and window b. At cornice		
4. Does the paint that was used pose a health hazard? a. Nontoxic b. Fire retardant		
5. Are the materials used in the ceiling, walls, and floor safe? a. Fire retardant b. Nonskid c. Nontoxic		
6. Are the electrical materials and methods safe? a. Grounded circuit b. 12 gauge conductors c. Device covers in place d. Wiring concealed		
7. Is the plumbing system installed according to code? a. DWV b. Hot water c. Cold water d. Gas e. Sink		
8. Does the doorbell use low voltage current?		

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 325

ASSIGNMENT SHEET

LENDER'S INSPECTION CHECKLIST

Use the inspection checklist below. It will help you to check each item. You may add items to be checked if needed. The items that pass inspection are checked under the S (Satisfactory). Those that do not pass are checked under the U (Unsatisfactory). Make a list of the unsatisfactory items on the PUNCH LIST.

	S	U
1. Was all roofing that was purchased used?		
2. Did the builder use the quality of exterior surfacing that was specified? a. Siding b. Trim c. Window d. Door		
3. Was the caulking that was purchased used to seal cracks?		
4. Was the paint that was purchased used on the exterior of the structure?		
5. Were all of the materials used that were purchased to finish the interiors? a. Ceiling b. Walls c. Flooring		
6. Was the money spent for the correct kind and number of electrical devices? a. Switch b. Outlet c. Light fixture d. Conductors		
7. Were the plumbing lines that were specified put in place? a. DWV b. Hot water c. Cold water d. Gas e. Sink		
8. Was the doorbell installed?		

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 319

ASSIGNMENT SHEET

PUNCH LIST

To: Contractor _____ Date: _____

From: Project Lender _____

Subject: Inspection and Punch List for _____
(Project Name)

The items on the list below were found to be unsatisfactory. They must be corrected before the Certificate of Completion is signed.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

_____
(Signature)

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 320

PROJECT COMPLETION UNIT

ASSIGNMENT SHEET #3 — CLOSE THE CONTRACT

NAME _____ SCORE _____

Directions: Your instructor will set up the meeting. The following individuals will attend:

a. Owner

b. Project designer

c. Government officials

d. Financial lender

e. Contractor

f. Secretary

The following agenda may be used.

1. Announcements
2. Contractor provides signed approvals, releases, warranties, and manuals to owner.
3. "Certificate of Completion" is signed. (next page)
4. Owner makes final payment.
5. Meeting is adjourned.

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 52.7

ASSIGNMENT SHEET

CERTIFICATE OF COMPLETION

The _____ project at
(Project Name)
_____ in _____ of _____
(Address) (City) (State)
is complete. All releases and approvals are signed, and manuals are provided.

The Warranty Period begins on _____ and ends
(Date)
on _____
(Date)

Copy exhibits received the _____ day of _____, _____.
(Day) (Month) (Year)

Contractor _____ Owner _____
(Signature) (Signature)

Lender _____ Designer _____
(Signature) (Signature)

Building Inspector _____
(Signature)

Evaluation criteria

1. Was meeting held in a professional manner?
2. Were all forms filled out legibly?
3. Did all those participating cooperate fully in the closing process?

This copyrighted material is from the following source and is used by permission:
Exploring Construction Technology. Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium, Inc., 1987. page number 328

Utility Checklist

Utility systems are often taken for granted. Do you know how utilities are used and how much they cost? Use the checklist below to find out the use and cost of utilities in your home, a friend's home, or a small business. The costs do not have to be exact. Ask the person you interview to check his or her payment records and give you the approximate monthly or yearly utility costs. Explain that this information will be confidential. Your class will use this information to estimate the average cost for different types of structures.

This copyrighted material is from the following workbook and is used by permission:
Betts, M. Roger, et al. Exploring the Construction Industry. Bloomington, Illinois: McKnight Publishing Co., 1976.

1. What is being surveyed? ( ) a home ( ) a business ( ) a farm.

2. Electrical Power
   A. How is the electrical power used? ( ) Lighting. ( ) Household appliances. ( ) Heavy duty equipment. ( ) Cooking. ( ) Heating. ( ) Cooling. ( ) Heating water. ( ) Farm animals. ( ) Alarm systems. ( ) Communications. ( ) Other _____.
   B. Approximate monthly cost $_____ × 12 = yearly cost $_____.

3. Water
   A. How is water used? ( ) Household use. ( ) Business or industrial use. ( ) Agricultural use. ( ) Other _____.
   B. Approximate monthly cost $_____ × 12 = yearly cost $_____.

4. Natural Gas
   A. How is natural gas used? ( ) Heating. ( ) Cooling. ( ) Heat water. ( ) Clothes dryer. ( ) Cooking. ( ) Other _____.
   B. Approximate monthly cost $_____ × 12 = yearly cost $_____.

5. Drainage System
   A. Type of Drainage Systems: ( ) Septic tank. ( ) City or county sewer system. ( ) Storm drainage system. ( ) Other _____.
   B. Approximate monthly cost $_____ × 12 = yearly cost $_____.

6. Communications
   A. Type of communications systems: ( ) Telephone. ( ) Burglar Alarm System. ( ) Fire Alarm System. ( ) Intercom System. ( ) Music System. ( ) Other _____.
   B. Approximate monthly cost $_____ × 12 = yearly cost $_____.

(continued on next page)

7. Other Fuels

A. Fuel Oil: Approximate monthly cost $_____ × 12 = yearly cost $_____.

B. Coal: Approximate monthly cost $_____ × 12 = yearly cost $_____.

C. Wood: Approximate monthly cost $_____ × 12 = yearly cost $_____.

D. Other: _____ Approximate monthly cost $_____ × 12 = yearly cost $_____.

TOTAL COSTS

	Monthly	Yearly
1. Electricity	_____	_____
2. Water	_____	_____
3. Natural Gas	_____	_____
4. Drainage	_____	_____
5. Communications	_____	_____
6. Other Fuels	_____	_____
	Total _____	Total _____

This copyrighted material is from the following workbook and is used by permission:
Betts, M. Roger, et al. Exploring the Construction Industry. Bloomington, Illinois: McKnight Publishing Co., 1976.

Foundation Wall Evaluation Checklist

	Yes	No
1. The foundation wall is centered on the footing, 6" (15.2 cm) in from each end.	( )	( )
2. The top of the bricks are level.	( )	( )
3. The sill plate is level.	( )	( )
4. The ends of the foundation wall are plumb.	( )	( )
5. The sides of the foundation wall are plumb.	( )	( )
6. All mortar joints are approximately 3/8" (1.0 cm).	( )	( )
7. The job is done neatly. There are no mortar droppings or smears on the block or brick.	( )	( )

Builders:	Inspectors:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

This copyrighted material is from the following workbook and is used by permission:
Betts, M. Roger, et al. Exploring the Construction Industry. Bloomington, Illinois: McKnight Publishing Co., 1976.

Wall Inspection Checklist

Module _____

	Yes	No
GENERAL INSPECTION		
All joints flush.	( )	( )
Nails flush.	( )	( )
Wood undamaged.	( )	( )
Bottom plate nailed firmly to header.	( )	( )
Braces firm.	( )	( )
Corner post firm.	( )	( )
Wall height, width, and length correct (wall matches working drawings).	( )	( )
FRAMING SQUARE INSPECTION		
Wall frame square with edge of subfloor.	( )	( )
Studs and bottom plate square.	( )	( )
Studs and top plate square.	( )	( )
Corner post square.	( )	( )
LEVEL INSPECTION		
Bottom plate level.	( )	( )
Studs plumb.	( )	( )
Top plate level.	( )	( )
RECOMMEND THAT THE WORK BE TORN APART AND FRAMED AGAIN	( )	( )

COMMENTS: _____ Inspected by: _____

This copyrighted material is from the following workbook and is used by permission:
Betts, M. Roger, et al. Exploring the Construction Industry. Bloomington, Illinois: McKnight Publishing Co., 1976.

Footing Form and Reinforcement Inspection Checklist

Item	Accurate	Inaccurate	Amount of Error
1. All inside corners of form are square. (Use try square to check.)	( )	( )	_____
2. The boards are cut square so they fit together tightly at corners.	( )	( )	_____
3. Inside width of form is 8" (20.3 cm).	( )	( )	_____
4. Inside length of form is 28" (71.1 cm).	( )	( )	_____
5. Both long reinforcement rods are approximately 24" (61.0 cm) long.	( )	( )	_____
6. All three cross reinforcements are approximately 4" (10.2 cm) long.	( )	( )	_____
7. Long reinforcement rod centers are 3" (7.6 cm) apart.	( )	( )	_____
8. End cross reinforcements are placed on top of the long rods and are 2" (5.1 cm) in from the ends.	( )	( )	_____
9. Middle cross reinforcement rod is 10" (25.4 cm) from the two end reinforcing rods.	( )	( )	_____
10. All reinforcement rods are securely tied together.	( )	( )	_____
11. All chairs are properly placed and tied.	( )	( )	_____
12. Reinforcement is approximately 1 1/2" (3.8 cm) off the bottom of the form.	( )	( )	_____

Date _____

Signatures of Inspectors:

_____

_____

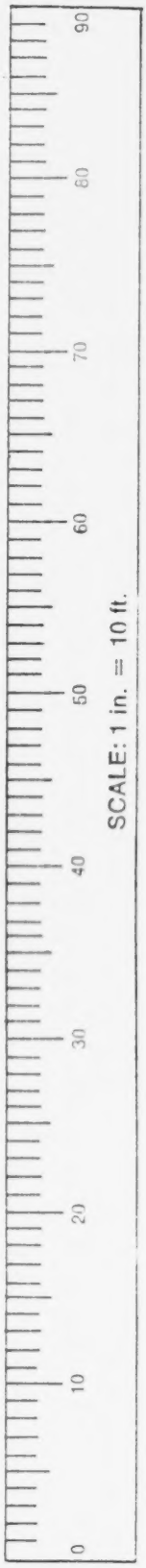
_____

_____

This copyrighted material is from the following workbook and is used by permission:
Betts, M. Roger, et al. Exploring the Construction Industry. Bloomington, Illinois: McKnight Publishing Co., 1976.

Cut Along Dotted Line

DESIGNING A PARKING LOT



APPENDIX X

TEST

MEASURING ACHIEVEMENT

The following are sample or suggested test questions for each unit of study. The following test questions are by no means complete nor exhaustive. They are merely a representation of some of the better material available. Also included are suggested directions for examinations.

General Directions

This test consists of five parts: true and false, matching, multiple choice, completion, and listing. There will be 50 minutes allotted for this test. Read the instructions carefully. If there are questions, please ask them before the class starts the test. If there are urgent questions while taking the test, raise your hand. Upon completion of the test, turn your paper over and remain quietly in your seat. Begin.

True and False Test:

Read the complete statement. If the statement is true, circle the T; if the statement is false, circle the F.

Matching:

In the blank at the left of the item number, record the letter of the description in the right column which identifies the item.

Multiple Choice:

In the blank at the left of the item number, record the letter of the answer that makes the statement correct.

Completion:

Fill in each blank with a work or words that complete(s) the statement correctly.

Listing:

In the space provided, list concisely the information called for in each question.

Sample Test Layout

Date_____
Name_____
Period_____
Seat Number_____
Test Number_____
Letter Grade_____

Score_____

Exam Unit __11__

Safety

1. List four pieces of equipment that can be hazardous when used improperly.

   1. 3.

   2. 4.

2. List four personal safety practices that are to be followed.

   1. 3.

   2. 4.

3. List four things that can create hazards related to improper student behavior and room arrangement.

   1. 3.

   2. 4.

Name:_____Class:_____Date_____

Safety Exam #1

GENERAL SAFETY PRACTICES

1. Multiple Choice. For each item below select the one best answer. Then write the letter that represents your choice on the line to the left of each item.

_____ 1. Why should bench and cabinet drawers and locker doors be kept closed?

A. To avoid breaking the drawers and doors
B. To make the shop look uniform
C. To avoid walking hazards
D. To avoid spilling the contents

_____ 2. The first person to whom all injuries, however slight, should be reported is:

A. The nearest student
B. The counselor
C. The teacher
D. The principal

_____ 3. All injuries should be reported to the teacher:

A. So he/she can fill out an accident report
B. So the hazard can be eliminated
C. So the injured party can receive first aid or be taken to the doctor, if necessary
D. So the cause of the accident can be investigated
E. All of the above

_____ 4. The main reason throwing small pieces of metal in the shop is prohibited is:

A. There is a danger of eye injury
B. You may hit the teacher
C. You may throw away a piece you will need later
D. Windows and lights will be broken

_____ 5. Horseplay and practical joking are prohibited in the shop because:

A. There is not enough room for play
B. Playing should be confined to the gymnasium
C. You may break some tools
D. It prevents other students from working
E. You may injure yourself or someone else

Sample Test Questions for Unit III

INTRODUCTION TO THE CONSTRUCTION INDUSTRY

1. List four types of construction.
   1. _____ 2. _____ 3. _____ 4. _____

2. Matching

   Choose which kind of construction in the right-hand column is indicated by each item listed in the left-hand column

1. Bus terminal	_____	A. Civil Construction
2. Apartment building	_____	B. Industrial Construction
3. Single home	_____	C. Light Construction
4. Hospital	_____	D. Heavy Construction
5. Water Tower	_____	
6. Housing Development	_____	
7. Grain Elevator	_____	
8. Subway	_____	

3. Matching

   Choose the occupation in the right-hand column which performs each duty in the left-hand column.

1. Designs machinery for operating a drawbridge	a. mechanical engineer
2. Designs the approach to a major highway	b. laborer
3. Handles materials at a construction site	c. architect
4. Inspects new homes for compliance with city ordinances	d. building code officer
	e. construction superintendant
	f. civil engineer

Sample Test for Unit IV

BASIC CONSTRUCTION TOOLS AND EQUIPMENT

1. List the measurement and layout tools that would be used by workers in each of the following trades:

   A. Mason

   B. Carpenter

   C. Electrician

2. Matching - Choose the item in the right-hand column which is associated with each item in the left-hand column.

1. Bit brace	a) used for sawing metal
2. Twist drill bits	b) used for drilling holes in metal
3. Crosscut saw	c) has a square tang
4. Hacksaw	d) used for sawing with the grain
5. Combination drill	e) used for sawing across the grain
6. Hand drill	f) used for cutting wallboard
7. Auger bits	g) used for sawing intricate shapes
8. Rip saw	h) used for drilling screw holes
9. Coping saw	i) has a two-jaw chuck
10. Utility knife	j) has a three-jaw chuck

3. Multiple Choice - What is the main advantage of power tools over hand tools?
   a) Power tools normally outlast hand tools.
   b) Greater accuracy is possible with power tools.
   c) Power tools can perform an operation more quickly.
   d) Power tools can perform operations that cannot be performed with hand tools.

4. For which operation might a carpenter use a table saw?
   a) Sawing large curves in plywood
   b) Cutting sheet metal for heating ducts
   c) Cutting openings in paneling for electrical outlets
   d) Ripping lumber for a concrete form

Sample Test for Unit V

CONSTRUCTION MATHEMATICS

1. Compute the volume of a prism which has a base area of 15 square inches and an altitude of 6 inches.

2. Compute the volume of a pyramid which has a base of 24 square feet and an altitude of 6 feet.

3. Addition of angles:

23°	27°44'	6°25'18"
+59°	+88°15'	+13°48'16"

4. Subtraction of angles:

67°	48°17'	120°17'44"
- 28°	-32° 9'	-112°48'53"

5. Find the area of a floor 21'- 6" long by 17'- 0" wide.

6. Determine the area of a circle which has a radius of 6.5 inches.

Sample Test for Unit VI

SAFETY AND HEALTH IN CONSTRUCTION

Multiple Choice:

_____ 1. You should wear suitable eye protection

A. to improve your vision.
B. when engaged in any activity where eye hazards may exist.
C. to avoid myopia.
D. when you want to improve your appearance

_____ 2. Wear proper goggles, face shields, aprons and other personal protective equipment:

A. only when authority is on the job.
B. on all jobs which require them.
C. only when forced to do so.

_____ 3. Injuries are most likely to occur to persons who:

A. violate safety regulations.
B. do nothing.
C. consider safety in all that they do.

Sample Unit Test for Unit VII

PRE-CONSTRUCTION PLANNING

Multiple Choice

1. Land zoned for commercial structures allows the buildings to be used for:

   a) heavy industry.
   b) railroad cargo handling.
   c) supermarkets and consumer outlets.
   d) farming activity.

2. Arrange in order the following steps in surveying.

   a) Do field work
   b) Make drawings
   c) Do research
   d) Know purpose
   e) Do plotting

3. The _____ shape is used when strength and low weight are needed.

   a) Hexagon
   b) Square
   c) Symmetrical
   d) Triangle

4. Which of the following is not shown in a site plan?

   a) final shape of the site
   b) section view of foundation
   c) placement of structures
   d) boundary lines
   e) easements

5. A _____ plan states that the contractor is to be paid a set amount when certain stages of the project are complete.

   a) partial payment
   b) CPFF
   c) incentive
   d) unit payment
   e) CPPC

Sample Test for Unit VIII

CONSTRUCTION PROCESSES AND PRODUCTION

1. List the seven kinds of earthwork in addition to compacting.
   1.
   2.
   3.
   4.
   5.
   6.
   7.

2. An excavation method used to make round holes in soil is _____.

3. The tall skyscrapers of today could not be built if it were not for _____ frames.

4. Roof framing members that include both rafters and ceiling joists are called _____.

5. Shingles are measured and sold by the _____.

6. Several layers of building felt and bitumen are used in _____ roofs.

7. _____ has steps that appear and then move from level to another.

8. _____ is a round or square tube that uses gravity to move things to lower levels.

9. Water vapor in air is called _____.

10. A device designed to absorb the shock of turning water on and off is a/an _____.

11. Vents in a drain system allow _____ gas to escape to the outside.

12. The electric company installs everything up to and including the _____ in an electric power system.

13. In a junction box, all wires colored _____ are connected together.

14. Information about the function of machines and processes is gathered with _____.

15. A radiator transfers heat to our hand by _____ when we touch it.

16. The ability of insulation to reduce the conduction of heat is _____ value.

17. Today, plastering is used less and _____ board is used more.

18. Space is divided up with _____ walls.

19. The final shape of the site and the location of all structures, plantings, and features are shown in the _____plan.

20. The quickest way to get a lawn started is to use _____.

21. When the project is nearly complete, a certificate of _____ is used.

22. Before partial payments are made, people called _____ conduct an inspection to see what materials and labor were used and if all the materials were used up.

23. _____ gives a contractor permission to build.

24. _____ describes how land is to be used.

25. _____ includes construction and land use standards.

Sample Test for Unit IX

CONSTRUCTION COMPLETION

Short Answers/Fill in the blanks

1. Name at least three things that are described on the landscape plan.

2. During a final inspection all defects are placed on a _____ list.

3. When a problem in payment is resolved, a _____ is signed.

4. When the owner owes money on the property, a _____ is put on the property.

5. Arrange in order the steps in closing a contract by placing the correct sequence numbers (1-4) in the appropriate blanks.

   _____ a. Releases are obtained
   _____ b. Warranties and manuals are gathered
   _____ c. Final payment is made
   _____ d. Approvals are written

6. Complete statements concerning transferring the project by circling the correct words.

   a. When all work is completed, the project is transferred from the contractor to the (owner, designer)

   b. A (bill, contract) is used to guide this process.

APPENDIX XI

STUDENT COMPETITIVE EVENTS

GENERAL RULES

COMPETITIVE EVENTS

I. The officially approved competitive events are:

Bridge Building
Computer-Aided Drafting (CAD)
Construction
Chapter Team
Creed
Drawing Interpretation (Goodheart-Wilcox)
Dream House (Modern School Supplies)
Drafting Problems
Electricity/Electronics (Brodhead-Garrett)
Engineering Problems (Modern School Supplies)
Extemporaneous Speech
Graphic Logo
Industrial Bowl
Manufacturing Prototype
Material Processes
Metric 500 (PITSCO)
Outstanding AIASA Advisor
Outstanding AIASA Chapter
Outstanding School (Paxton/Patterson and Graves Humphreys)
Outstanding AIASA State
Outstanding AIASA Student (National Association of Women in Construction)
Prepared Speech
Record Book
Research Paper
Safety Poster
Technical Report Writing (School Shop Magazine)
Technology Process Display

II. LEVELS AND PARTICIPATION

A. Levels

Ninth graders may compete in individual competitive events according to the level which corresponds with their official school classification as follows:

Level I - Junior High and Middle Schools
Grades 6, 7, 8, (9)

Level II - Middle Schools and High Schools
Grades (9), 10, 11, 12

In schools with grades seven through twelve, ninth graders must be declared by their advisors as Level I or Level II. Students may compete in only one level.

Students in Level I chartered chapters may not be used to compete in Level II team events.

B. Participation

1. In chapter and team events, an AIASA chapter must enter the event according to the level which corresponds to its official school classification. (e.g., Thompson Jr. High must enter the Level I chapter team competitive event. Any chapter which has both Level I and II members may enter only as a Level II chapter.)

2. Advisors will be entered in the same level their chapter is entered.

3. Students and advisors must be registered and in attendance at the National Conference in order to enter and become finalists in competition.

4. AIASA members, advisors, and chapters must be in good standing with AIASA in order to enter any competitive event.

5. Contestants are entitled to have only one (1) entry per event. (e.g., only one Metric 500 car or only one safety poster, etc.)

6. Conference participants may enter a maximum of six (6) competitive events.

7. AIASA membership rights extend through the year of graduation. It is permissible for students who graduate at mid-term to compete at the National Conference which immediately follows their graduation.

III. Chapter and chapter member entries will be restricted to the following:

NOTE:

1. The Industrial Bowl - Oral and Written contest allows three individual members to enter.

2. The Computer-Aided Drafting (CAD) contest - Allow the state association to determine the finalists.

A. No more than two (2) entries per event per chapter in each of the following:

1. Creed
2. Drafting Problems
3. Drawing Interpretation - Goodheart-Wilcox
4. Electricity/Electronics - Brodhead-Garrett
5. Engineering Problems - Modern School Supplies
6. Extemporaneous Speech
7. Graphic Logo
8. Manufacturing Prototype

9. Metric 500 - PITSCO
10. Prepared Speech
11. Research Paper
12. Safety Poster
13. Technical Report Writing - School Shop Magazine

NOTE: A student may enter only one (1) of the following events:

1. Creed
2. Extemporaneous Speech
3. Prepared Speech

B. No more than one (1) entry per chapter in:

1. Bridge Building (2 students per team)
2. Chapter Team (6 students per team)
3. Construction (2 students per team)
4. Dream House - Modern School Supplies
5. Material Processes
6. Industrial Bowl - Oral and Written (3 students per team)
7. Outstanding AIASA Advisor
8. Outstanding AIASA Chapter
9. Outstanding AIASA Student - National Association of Women in Construction
10. Record Book
11. Technology Process Display

C. A student may enter only one (1) of the following four (4) interview events:

1. Electricity/Electronics - Brodhead-Garrett
2. Outstanding AIASA Chapter
3. Outstanding AIASA Student

D. Contests which require a pre-conference mail-in deadline to be met:

1. Computer-Aided Drafting (CAD)
2. Material Processes
3. Outstanding AIASA Advisor
4. Outstanding AIASA Chapter
5. Outstanding AIASA Student - National Association of Women in Construction
6. Research Paper

IV. Awards

A. Awards will be presented to the winning entries in each competitive event at the awards presentation ceremonies. First, second, and third place awards will be presented in following competitive events:

Bridge Building I & II
Computer-Aided Drafting CAD I & II

Creed I
Chapter Team I & II
Drafting Problems I
Drawing Interpretation I & II
Goodheart-Wilcox
Dream House I & II
Modern School Supplies
Electricity/Electronics I & II
Brodhead-Garrett
Engineering Problems II
Modern School Supplies
Extemporaneous Speech I & II
Graphic Logo I & II
Industrial Bowl (Written and Oral) I & II
Manufacturing Prototype I & II
Material Processes I & II
Metric 500 I & II
PITSCO
Outstanding AIASA Advisor I & II
Outstanding AIASA Chapter I & II
Outstanding School I & II
Paxton/Patterson and Graves Humphreys
Outstanding AIASA State I & II
Outstanding AIASA Student I & II
National Association of Women in Construction
Prepared Speech I & II
Record Book I & II
Research Paper II
Safety Poster I & II
Technical Report Writing I & II
School Shop Magazine
Technology Process Display I & II

B. Finalists will be identified in all events. Those not receiving an award will receive recognition at the awards presentation by introduction and a certificate to be distributed at a later date. The number of finalists for a given event will be determined for each level and event as follows:

1. 7 or less entries	3 finalists
2. 8-12 entries	4 finalists
3. 13-17 entries	5 finalists
4. 18-23 entries	6 finalists
5. 24 or more entries	7 finalists

C. First, second and third place awards are included in the number of finalists.

V. Participation

A. It is the intent of AIASA, Inc. to involve as many different AIASA members as possible for competitive events and recognition in the setting of fair-play practices and guidelines.

B. In the event a question or problem arises that has not been covered in the "General Rules: or the individual competitive event guidelines, the Rules Interpretation Panel will render a decision for the conference.

Should a conflict develop that prevents a member from participating in more than one event, the contestant will decide which contest entry will be eliminated.

C. It will be the individual responsibility of all contestants to obtain all rules and guidelines for concerned events. Lack of knowledge or understanding about a particular event will not be reason or excuse for individual change or adjustment consideration.

D. Contest concerns during the AIASA National Conference for any event should be submitted in writing to the Rules Interpretation Panel.

VI. Pre-conference mail-in contests

A. Postcards

All entries should include two (2) stamped, self-addressed postcards to be mailed back to contestants when:

1. The entry is received by the coordinator, to notify contestant that the entry has been received and recorded.

2. The finalists have been chosen, to notify the contestants of their status as finalist for that particular event.

B. Format to be used

All contestants in Outstanding Chapter, Outstanding Student, Outstanding Advisor, Energy Conservation, and Research Paper for Level II shall photocopy the format pages from the Competitive Events Guidelines for use in submitting an entry into these events.

VII. Recording devices--No recording devices will be allowed in any competitive event.

Revised 11/87

BRIDGE BUILDING

OVERVIEW: AIASA teams (two members per team) entering the Bridge Building contest will construct a model truss bridge to be destructively tested to determine the design efficiency of the bridge.

I. CONTEST PURPOSE

The purpose of the Bridge Building contest is to provide a means for AIASA team members to demonstrate their ability to fabricate a truss bridge after having been assigned span and width specifications.

II. ELIGIBILITY FOR ENTRY

Each chapter may enter only one team. A team consists of no more than two chapter members. Team members must be from the same chapter.

III. LEVELS OF COMPETITION

Level I and Level II as described in General Rules.

IV. TIME LIMITATIONS

The allotted time for design and construction of the bridge will be two (2) hours and thirty (30) minutes. All contestants in this event must arrive and be "in place" at the specified time and location.

V. SPECIFIC REGULATIONS

A. There shall be two (2) members per team--no more, no less.

B. All work must be done in the specified area.

C. No materials will be issued until a sketch has been provided to the judges. The sketch will be drawn at the contest on paper supplied by AIASA. In the event that a tie occurs in the contest, the sketch will be used to determine the winner.

D. All materials will be provided. Contestants will be issued 20 feet of balsa strips in 24-inch segments. Full-length wood strips will be distributed and their total length charged to each team. Unused full-length strips may be returned to be discounted from the team's total utilized material to become the official length used in the team's efficiency formula.

E. Pins and/or tape used in construction of the bridge must be removed by the team when the 2 1/2 hours of the contest have ended. Failure to remove pins and/or tape will constitute disqualification.

F. The following definitions and graphic explanations are an integral part of the contest regulations.

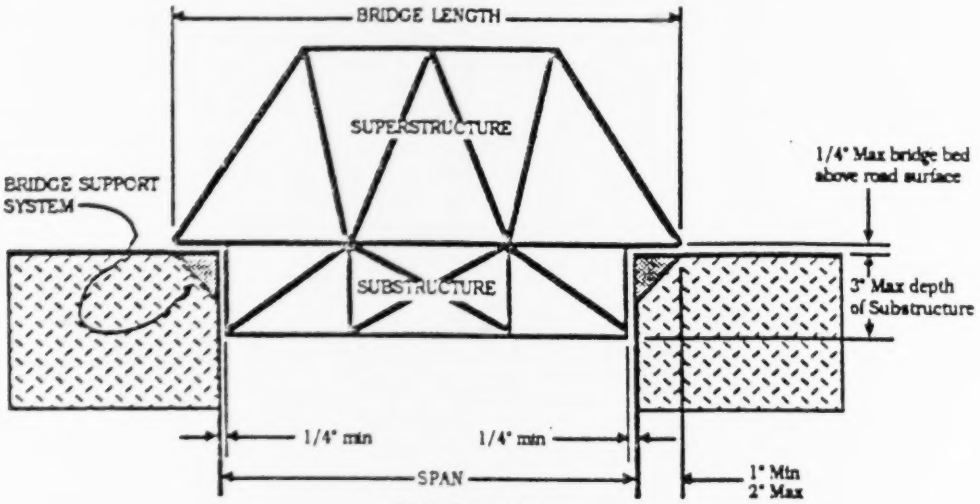


DIAGRAM A

Bridge Length: The overall length of the bridge, including the span and the required bearing surface are of the roadbed (1" minimum, 2" maximum) on the bridge supports.

Truss Bridge: A bridge with a super-structure and/or a sub-structure supporting a roadbed across a span.

Super-Structure: The structure of a bridge which extends below the roadbed. Three inch (3") maximum.

Test Block: That piece of test apparatus to which the hook that holds the weight is attached. The length of which will be 2" less than the span announced at the national conference contest. See diagram C.

Span: The distance between bridge supports.

Roadbed: The part of the bridge that is meant to be traveled on. The bridge must be constructed to allow the test block (without the hook) to pass through the bridge opening on the roadbed from one end to the other. The roadbed must be flat and not greater than 1/4" thick.

Failure: The point at which a truss bridge collapses or is determined to have failed due to the stresses of the load placed on it.

Lamination: Two or more pieces of 1/8" x 1/8" beams glued together surface-to-surface (wood grain running parallel).

G. The exact span of the bridge to be built will be posted at the beginning of the competition. The posted specifications will be within the following limits:

Span	8" minimum 18" maximum
Width	3" + 1/4"

H. Bridges must be constructed in such a manner as to accommodate the test hook (see Diagram C-C) at the bridge's center. The roadbed of the bridge must be free of obstructions.

I. Bridges will be allowed to dry a minimum of twelve (12) hours. Bridges will then be tested by applying weight until they fail.

J. A truss member may include laminations (refer to the definition of lamination on this page and to the illustration below). The maximum amount of glue allowed will be 1/4" for every two inches of lamination. No more than two pieces may be laminated.

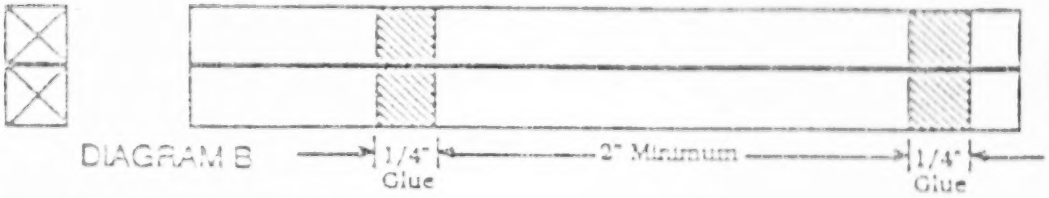


DIAGRAM B

VI. REQUIRED CONTEST PERSONNEL

A. Contest Coordinator

B. Judges - a minimum of three (3) per level

C. Timekeeper/Monitor

VII. REQUIRED MATERIALS AND SUPPLIES-

1. Table and chairs for judges.
2. Tables and chairs for contestants. Tables should be suitable for cutting and gluing. Allow table space of six (6) sq. ft. per team (2' x 3').
3. Stopwatch or clock for timekeeping.
4. Room - must be securable for equipment and entries.
5. Construction materials
   a. Adhesive (Aliphatic resin - Elmers carpenter glue or Titebond tinted with two ounces of food coloring per gallon.)
   b. Balsa 1/8" x 1/8"

6. Construction tools
   a. Grid paper, 1/4" squares, 11" x 17"
   b. Fiber board, 1/2" x 12" x 12"
   c. Cutting board, 12" x 12"
   d. Single edge razor blade
   e. Straight pins
   f. Ruler
   g. Tape

7. Testing equipment
   a. Testing block set (6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16) (see Diagram C)
   b. Testing hook (See Diagram C)
   c. Two 5-gallon containers per testing station
   d. Lead shot weight
   e. Scales
   f. Calculator

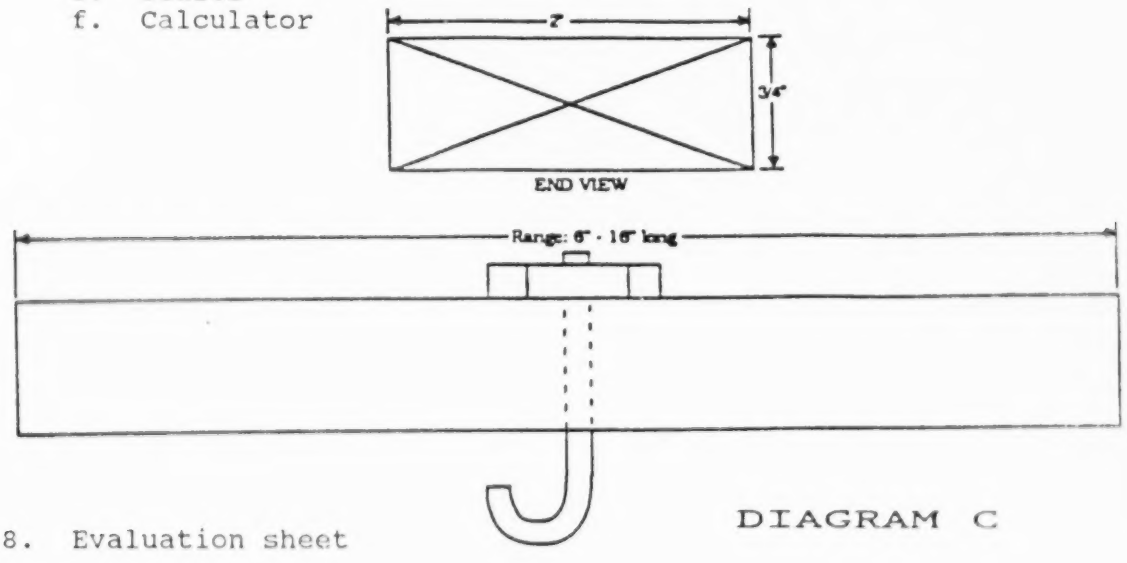


DIAGRAM C

8. Evaluation sheet

VIII. CRITERIA FOR JUDGING

A. Bridge efficiency shall be determined by the following formula

$$\text{EFFICIENCY (E)} = \frac{\text{Failure Weight}}{\text{Length of wood used (in inches)}}$$

B. An increasing load will be applied to the bridge via the test hook until the bridge fails. The load will be weighed and entered in the formula as "Failure Weight."

C. Ten (10) full-length wood strips (20 feet total) will be distributed and their total length charged to each team. Unused full-length strips may be returned to be deducted from the team's total utilized material to become the official amount of material used by the team. The official amount of material used by the team will be entered in the formula as "Length of Wood used."

CONTEST COORDINATOR INSTRUCTION SHEET

BRIDGE BUILDING

I. CONTENTS

A. Judges' rating sheets
B. Contest guidelines for the Coordinator and the judges
C. Competitive Events Personnel and Contest Entry List
D. Results envelope

II. PROCEDURES

A. Check the contents of the Coordinator's envelope.

B. Review the contest limitations, regulations, and procedures. Any deviation from the above by any contestant shall result in disqualification.

C. Distribute the judges' materials.

D. Review the contest limitations, regulations, and procedures with the judges to clear up any questions or misunderstandings.

E. Check in the contestants at the time printed in the program. Anyone reporting but not on the Entry List shall be sent to the Competitive Events Coordinator and shall only be entered upon returning with a note of approval from the Competitive Events Coordinator. Review rules with contestants.

F. The judges will monitor the contestants during the bridge construction.

G. At the end of the construction time, judges will collect the bridges and label each with the contestant's entry number.

H. The judges will secure the entries in an area designated by the Competitive Events Coordinator. They will also assist in taking them to the testing room the next day.

I. Using the results envelope provided, submit to the Competitive Events Coordinator:

1. Competitive Events Personnel and Contestant Entry List.
2. Judges' Rating Sheet(s)

SPECIAL NOTE: Only the testing portion of this contest is a spectator event.

PLEASE IDENTIFY THE CONTEST AND THE LEVEL ON THE FRONT OF THE RESULTS ENVELOPE AND SEAL IT BEFORE RETURNING IT.

AIASA BRIDGE BUILDING CONTEST

JUDGE'S OFFICIAL RATING SHEET

(circle one)
LEVEL I
LEVEL II

ENTRANTS I D → / JUDGING CRITERIA								
Check here when Bridge Plan is received. NOTE: This has no point value, however, a plan must be submitted or the entry will not be considered for competition. In case of a tie, the bridge plan is used to determine the winner.								
Check here for proper Bridge Size. NOTE: Bridge must be within the specified size limits set for this particular conference. Any bridge not of the proper size will not be considered for competition.								
Total amount of materials used. This figure is to be the linear inches of wood used to construct the bridge as described in VIII C of the contest rules.								
Failure weight. The actual weight of the bucket and loading material at the time the bridge fails. Accuracy of this measure will be determined by the scale used at the conference.								
EFFICIENCY RATING See rules for proper formula. All ratings should be accurate to three decimal places. Example: 1.123								
Judges: Do not mark in this area, please.								

I certify these results to be true and accurate to the best of my knowledge and ability.

_____

Judge's signature

MODERN SCHOOL SUPPLIES DREAM HOUSE

OVERVIEW: AIASA members or chapters entering the Modern School Supplies Dream House contest are required to submit a floor plan of a house and a three-dimensional model of the house shown on the floor plan.

I. CONTEST PURPOSE

The purpose of the Modern School Supplies Dream House contest is to provide a means for AIASA chapter members to demonstrate their ability to plan, draw, and construct a model of a house to scale.

II. ELIGIBILITY FOR ENTRY

A. No chapter may submit more than one (1) entry.

B. See "General Rules" for additional information.

III. LEVELS OF COMPETITION

Level I and Level II as described in "General Rules".

IV. TIME LIMITATIONS

While this in not a "timed" event, all schedules must be adhered to as presented in Sections V and VI.

V. SPECIFIC REGULATIONS

A. Special Contest Rules

1. Dream house model cannot be placed on a site board larger than 24" square or thicker than 3/4".

2. This is a suggested list of materials that could be used in constructing the dream house. (No one may use glass.)

a. Balsa
b. Plywood - not to exceed 1/4" thickness
c. Hardboard (paneling) - not to exceed 1/4" thickness
d. Styrofoam/urethane (firm textured)
e. Dowels - not to exceed 1/4" thickness

3. A complete list of materials shall accompany each entry.

4. Floor and wall coverings such as rugs, linoleum, wallpaper, etc. may be used in the construction of this house.

5. No furniture is to be included in the dream house; however, attached buildings may be included.

6. A floor plan designed and drawn by the member(s) of the chapter submitting entry must accompany each dream house. (Please note: Even though some entries include multiple overlays of drawings, only the floor plan and model will be judged.)

7. This can be an individual or group project.

VI. PROCEDURE

A. Registration - Contest participants must register for the event in accordance with procedures established for each conference.

B. Contestants must have dream house in judging room specified in conference program before deadline.

C. Dream house may be picked up at the assigned pick-up time.

VII. REQUIRED CONTEST PERSONNEL AND EQUIPMENT

A. Contest Coordinator
B. Judges - three (3) or more per level
C. Two (2) personnel assigned to check in and receive entries
D. Person assigned for security
E. Display tables for houses (at least six 2' x 8' tables are required)

VIII. CRITERIA FOR JUDGING

Quality of Drawing	15 points
Overall Appearance	15 points
Quality of Construction	15 points
Basic and Non-Basic Activities	20 points
Interior Planning	20 points
Landscaping	10 points
Quality of Material List	5 points
TOTAL	100 points

Definition of national-level judging criteria:

1. Basic Activities

   The activities which go on in a house require:

   a. Sleeping space
   b. Eating space
   c. Relaxing space
   d. Washing space

2. Non-Basic Activities

   Non-basic activities are those that are not always needed. What is included in non-basic depends on family likes and needs. For example, a person who enjoys "doing it himself/herself: may need a large workspace for a workshop. In most homes, however, dens, studies, dressing rooms, children's playroom, and sewing rooms are examples of non-basic parts of houses. Non-basics are added according to the likes and needs of family or individuals.

3. Traffic Flow

   Traffic flow refers to the path people take in getting from one area to another in a house. Traffic flow patterns would refer to how the traffic flows to most used areas as well as the least used areas. Is it good/bad?

4. Placement of Rooms

   This refers to location of rooms in relation to their function, use, and closeness to other areas used in conjunction with them. That is, you would not want the kitchen on one end and the dining room on the far end. Bathrooms should be easy to get to from bedrooms, yet one bathroom must be convenient to other areas, such as living room, den, playroom, etc.

5. Planning within Each Room

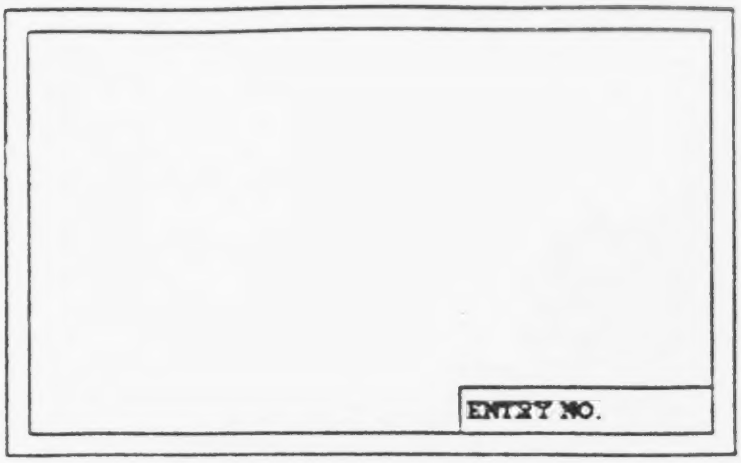
   This has to do with how well each room is planned for its function. Is the kitchen well designed for convenient use of items, such as sink, stove, and refrigerator? How convenient is eating area to kitchen? Are insides of bathrooms well arranged?

6. Landscaping and Appearance

   How well is it landscaped and how does it look?

Dream House

1.



Max. Drawing Sheet Size 24 X 36

CONTEST COORDINATOR INSTRUCTION SHEET

MODERN SCHOOL SUPPLIES DREAM HOUSE

I. CONTENTS

A. Judges' rating sheets
B. Contest guidelines for the Coordinator and the judges
C. Competitive Events Personnel and Contestant/Team Entry List
D. Results envelope
E. Complimentary items for Coordinator and judges

II. PROCEDURES

A. Check the contents of the Coordinator's envelope.

B. Review the contest limitations, regulations, and procedures. Any deviation from the above by any contestant or team shall result in disqualification.

C. Distribute the judges' materials.

D. Review the limitations, regulations, and procedures with the judges. Clear up any questions or misunderstandings.

E. Secure the judges' signatures on their rating sheets.

F. Using the results envelope provided, submit to the Competitive Events Coordinator:

1. Competitive Events Personnel and Contestant/Team Entry List
2. Judges' Rating Sheets

PLEASE IDENTIFY THE CONTEST AND THE LEVEL ON THE FRONT OF THE RESULTS ENVELOPE AND SEAL IT BEFORE RETURNING IT.

AIASA Dream House

Judge's Official Rating Sheet

Level 1 or 2 (Circle)

Judging Criteria \ Entrant's I.D. ----->													
1. Quality of Drawing ..... 15 pts. max.													
2. Overall Appearance of Model ..... 15 pts. max.													
3. Quality of Model Construction ..... 15 pts. max.													
4. Basic and Non-basic Activities ..... 20 pts. max. a. Provisions for the Basic Activities of: 1) Sleeping 3) Relaxing 2) Eating 4) Washing b. Provisions for Non-basic Activities or activities that are not always needed such as: 1) Dens 5) Playrooms 2) Studies 6) Sewing Rooms 3) Workshops 7) Etc. 4) Dressing Rooms													
5. Interior Planning ..... 20 pts. max a. Traffic Flow b. Placement of Rooms c. Planning within each Room													
6. Landscaping (appearance of) ..... 10 pts. max													
7. Quality of Material List ..... 5 pts. max													
Total ..... 100 pts. max.													

I certify these results to be true and accurate to the best of my knowledge and ability.

_____

Judge's Signature

BEST COPY AVAILABLE

BRODHEAD-GARRETT ELECTRICITY/ELECTRONICS

OVERVIEW: AIASA contestants in the Brodhead-Garrett Electricity/Electronics contest are required to design and build a product utilizing electricity/electronics. The products are judged on their complexity, ingenuity, quality of schematic, and the written description of the product.

I. CONTEST PURPOSE

The purpose of the Brodhead-Garrett Electricity/Electronics contest is to provide a means for AIASA members to demonstrate their ability to design, develop, and build an electrical/electronics product.

II. ELIGIBILITY FOR ENTRY

A. Entries are limited to two (2) per chapter.

B. See "General Rules" for additional information.

III. LEVELS OF COMPETITION

Level I and Level II as described in General Rules.

IV. TIME LIMITATIONS

A. Devices, drawings, parts list, and description will be set up in judging room during time specified for contest set up.

B. Interviews with contestant finalist will be limited to ten (10) minutes.

V. SPECIFIC REGULATIONS

A. Entries must be constructed or assembled by students.

B. Commercially prepared kits and/or pre-etched constructed circuit boards are not acceptable entries in this contest.

C. A schematic drawing and parts list must accompany entry.

D. Entry must include a one-page written description of application.

SAFETY POSTER

OVERVIEW: Safety Poster is designed to direct member attention to the area of laboratory safety. Contestants are required to produce a safety poster on a given size sheet using artistic expression.

I. CONTEST PURPOSE

The purpose of the Safety Poster contest is to provide a means for AIASA members to demonstrate their ability to recognize safety needs and communicate safety messages in visual forms.

II. ELIGIBILITY FOR ENTRY

Entries are limited to two (2) per chapter.

III. LEVELS OF COMPETITION

Level I and Level II as described in General Rules.

IV. TIME LIMITATIONS

While this is not a "timed" event, all schedules must be adhered to as presented in "Specific Regulations" and "Procedure" sections.

V. SPECIFIC REGULATIONS

A. Posters can depict any safety procedure/concept as long as it relates to some phase of Industrial Arts. All posters are to be a hanging type of cardboard or poster board.

B. Maximum size is limited to 24 inches by 36 inches. Total cost of materials in the production of the poster shall not exceed $5, and a list of costs must be neatly printed on the reverse side.

C. Contestants must not leave posters until entry numbers have been affixed by an official on the back of their posters. The entry number will be assigned during contest registration. Contestant's name, school, etc. must not be on poster for judging.

D. Entries must have been started after the past National Conference competition.

AIASA 12/85

VI. PROCEDURE

A. Registration - Contest participants must register for the event in accordance with procedures established for each conference.

B. Posters must be entered during the assigned contest entry time. Late entries will not be accepted.

C. Posters may be picked up only at the assigned time.

D. All winning safety posters become the property of AIASA, Inc. for a period of one year, to be utilized as deemed appropriate by the corporate board members.

VII. REQUIRED CONTEST PERSONNEL AND EQUIPMENT

A. Contest Coordinator to collect posters and position posters for judging per level.

B. Two (2) persons to register entries and place entries on the easel.

C. Three (3) judges per level.

D. Display easel for each level to be placed 10-15 feet from the judges.

VIII. CRITERIA AND JUDGING

A. Contestants shall be ranked in numerical order on the basis of final score to be determined by each judge without consultation with each other. The winner will be that contestant whose total score is the highest. Other placings shall be determined in the same manner.

B. Ratings will be based upon the following:

1. Eye Appeal.....20 points

2. Safety Content Validity
A measurement of the entrant's ability to present a valid safety theme for an Industrial Arts classroom.....20 points

3. Originality.....20 points

4. Organization.....20 points

5. Interest.....10 points

6. Neatness.....10 points

TOTAL 100 points

153

CONTEST COORDINATOR INSTRUCTION SHEET

SAFETY POSTER

I. CONTENTS

A. Judges' rating sheets
B. Contest guidelines for the Coordinator and judges
C. Competitive Events Personnel and Contestant/Team Entry List
D. Results envelope
E. Complimentary items for Coordinator and judges
F. Assorted stickers and marking pens

II. PROCEDURES

A. Check the contents of the Coordinator's envelope.

B. Review the contest limitations, regulations, and procedures. Any deviation from the above by any contestant or team shall result in disqualification.

C. Distribute the judges' materials.

D. Review the limitations, regulations, and procedures with the judges. Clear up any questions or misunderstandings.

E. Collect and position the safety posters at a reasonable distance for viewing by the judges and assist during the judging. Level I and Level II posters will receive color-coded stickers.

F. Secure the judges' signatures on their rating sheets.

G. Using the results envelope provided, submit to the Competitive Events Coordinator:

1. Competitive Events Personnel and Contestant/Team Entry List
2. Judges' Rating Sheets

PLEASE IDENTIFY THE CONTEST AND THE LEVEL ON THE FRONT OF THE RESULTS ENVELOPE AND SEAL IT BEFORE RETURNING IT.

AIASA Safety Poster

Judge's Official Rating Sheet

Level 1 or 2 (Circle)

Judging Criteria \ Entrant's I.D. ----->													
Eye Appeal — 20 pts. max													
Content — 20 pts. max													
Originality — 20 pts. max													
Organization — 20 pts. max													
Interest — 10 pts. max													
Neatness — 10 pts. max													
Total . . . . . 100 pts. max.													

I certify these results to be true and accurate to the best of my knowledge and ability

_____

Judge's Signature

SCHOOL SHOP MAGAZINE TECHNICAL REPORT WRITING

OVERVIEW: AIASA contestants in School Shop Magazine Technical Report Writing are required to read and analyze technical articles and write a comprehensive report summarizing the key elements of the articles.

I. CONTEST PURPOSE

The purpose of the School Shop Magazine Technical Report Writing contest is to provide a means for AIASA members to demonstrate their ability to consolidate various information into a complete and comprehensive report.

II. ELIGIBILITY FOR ENTRY

No more than two (2) entries per chapter.

III. LEVELS OF COMPETITION

Level I and Level II as described in General Rules.

IV. TIME LIMITATIONS

The allotted time for preparation of the paper shall be one (1) hour. All contestants in this event must arrive and be "in place" at the specified time and place, since only one time frame will be designated for this event.

V. SPECIFIC REGULATIONS

A. Only a dictionary and thesaurus may be carried into the contest area and be used in preparing the paper.

B. ALL contestants will begin after the instructions have been given and upon the signal of the Contest Coordinator. Late contestants will be disqualified.

C. Only contestants will be allowed in the contest area. No contestants will be allowed to leave the area until time has expired and papers are collected by the contest Coordinator. Should a contestant finish before the allotted time, the contestant will keep his/her paper, remain seated, and not talk to or disturb any other contestant. Violators will be disqualified at the discretion of the Contest Coordinator.

AIASA 12/85

TECHNOLOGY PROCESS DISPLAY

OVERVIEW: AIASA chapters entering the Technology Process Display contest are required to construct and display an industrial or technological process within a defined area.

I. CONTEST PURPOSE

The purpose of the Technology Process Display contest is to provide a means for AIASA chapters to demonstrate their knowledge of a process which they have researched by fabricating a display of the researched process.

II. ELIGIBILITY FOR ENTRY

A. Only AIASA chapters in good standing are eligible for entry.

B. Each chapter that is eligible may enter one display or exhibit for competition at the national contest level during the annual convention.

C. One entry per level.

III. LEVELS OF COMPETITION

Level I and Level II as described in General Rules.

IV. TIME AND LIMITATIONS

While this is not a "timed" event, all schedules must be adhered to as presented in Sections V and VI.

V. SPECIFIC REGULATIONS

A violation of regulations A or B will disqualify entry.

A. The exhibit size may not exceed 4'x4'x8' high.

B. The exhibit must depict some industry, industrial process, operation, or application of methods or processes used in industry. (Applications of new technology to solve technical problems are encouraged.)

VI. PROCEDURE

A. Registration - Contest participants must register for the event in accordance with procedures established for each conference.

B. Exhibit must be entered during the assigned contest entry time.

16.

C. Contest Coordinator must attach an entry number in the lower right corner of the exhibit. The contest number will be assigned during contest registration.

VII. SUPPLY LIST

A. Personnel

1. Contest Coordinator
2. Judges, three (3) per level
3. Helpers, two (2) per level

B. Equipment

1. Contest guidelines (3 per level)
2. Judges' rating sheets
3. Marking pens for judges, 12
4. Display tables for technology process display (a minimum of 12 4'x8' tables per level)
5. Table and chair for judges (3-person workstation per level
6. List of entries

VIII. CRITERIA FOR JUDGING

A. The exhibit must be a chapter project.

B. Each exhibit shall have a description of the industry or industrial process it depicts. The number of chapter members participating in the total exhibit shall also be noted.

C. No students or advisor will be allowed to stand by exhibits during judging.

D. Rating will be based on the following:

Organization	20 points
Originality	20 points
Subject Coverage	30 points
Interest and Appeal	15 points
Workmanship	15 points

CONTEST COORDINATOR INSTRUCTION SHEET

TECHNOLOGY PROCESS DISPLAY

I. CONTENTS

A. Judges' rating sheets
B. Contest guidelines for the Coordinator and the judges
C. Competitive Events Personnel and Contestant/Team Entry List
D. Results envelope
E. Complimentary items for Coordinator and judges

II. PROCEDURES

A. Check the contents of the Coordinator's envelope.

B. Review the contest limitations, regulations, and procedures.

C. Distribute the judges' materials.

D. Review the limitations, regulations, and procedures with the judges. Clear up any questions or misunderstandings.

E. Secure the judges' signatures on their rating sheets.

F. Using the results envelope provided, submit to the Competitive Events Coordinator:

1. Competitive Events Personnel and Contestant/Team Entry List
2. Judges' Rating Sheets

PLEASE IDENTIFY THE CONTEST AND THE LEVEL ON THE FRONT OF THE RESULTS ENVELOPE AND SEAL IT BEFORE RETURNING IT.

G. Secure area containing Technology Process Display.

AIASA Tech. Process Display

Judge's Official Rating Sheet

Level 1 or 2 (Circle)

Judging Criteria / Entrant's I.D. ----->													
Organization ..... 20 pts. max.													
Originality ..... 20 pts. max.													
Subject Coverage ..... 30 pts. max.													
Interest and Appeal ..... 15 pts. max.													
Workmanship ..... 15 pts. max.													
Total ..... 100 pts. max.													

I certify these results to be true and accurate to the best of my knowledge and ability.

_____

Judge's Signature

MATERIAL PROCESSES

OVERVIEW: AIASA contestants entering the Material Processes contest are required to submit drawings and photographs of a project which they have constructed during the school year.

I. CONTEST PURPOSE

The purpose of the Material Processes contest is to provide a means for AIASA members to demonstrate their ability to fabricate a project/product.

II. ELIGIBILITY FOR ENTRY

A. No chapter may submit more than one (1) entry.

B. See "General Rules" for additional information.

III. LEVELS OF COMPETITION

Level I and Level II as described in General Rules.

IV. TIME LIMITATIONS

A. Interviews with contestant finalists will be limited to 15 minutes.

B. Project/product must have been started and completed at school during the current school year under the supervision of an industrial arts/technology instructor.

C. Three (3) copies of the typed written development procedures, photographs, and working drawings must be mailed to the competitive events coordinator for this event (see Conference Information Book). These sets must be postmarked no later than the established deadline prior to the National Conference.

D. Finalists will be notified at least thirty (30) days before the conference by the self-addressed postcard submitted with the entry.

E. The student's and advisor's summer address must be included on the entry and on the self-addressed postcard.

V. SPECIFIC REGULATIONS

A. The finalists' project/product drawings and written development procedures with photographs will be set up in the display area.

B. Students entering this contest are required to:

1. Submit working drawings. The working drawings must provide all needed illustrations and identify all necessary dimensions on maximum size paper of size E. Working drawings will contain no more than five (5) sheets.

2. Submit the written development procedures typed on one side only on an 8-1/2" x 11" sheet. This piece should include the following: materials list, parts list, the finish used, and a statement of how the project was constructed and its function. The written development procedures shall be no more than 10 typed sheets. (Photographs are not to be included in the 10 sheet count.)

C. The project/product may be fabricated from one or more of the following materials: wood, metal, plastic, or earth materials.

D. Commercially produced kits are not acceptable entries.

E. The project must be the work of one (1) student.

F. Any special set-up and/or equipment required for the project/product entry will be the responsibility of the contestant.

G. The finalists will have the responsibility of transporting their project/product to the National Conference for final judging and display.

H. The project/product must fit in a space of 4' deep x 9' high x 8' wide provided at the National Conference.

I. Photographs must be used as part of the written development procedures. (Maximum size of the photographs is 3" x 5".)

VI. PROCEDURE

A. Registration for finalists

1. Contest finalists must register for the event in accordance with procedures established for the conference.

B. Judges - three (3) or more per level.

C. Two (2) personnel assigned to check in and receive entries.

D. Person assigned for security.

E. Display areas for entries (4' x 9' x 8').

VIII. CRITERIA FOR JUDGING

A. The written development procedures, photographs, and working drawings will be used to determine the finalists.

B. The following rating scale will be used to determine finalists

1. Complexity of project/product.... 10 points
2. Ingenuity/design..... 10 points
3. Quality of workmanship..... 20 points
4. Working drawings..... 10 points
5. Written development procedures with photographs or explanation..... 20 points
6. Interview..... 30 points

Total..... 100 points

AIASA Tech. Process Display

Judge's Official Rating Sheet

Level 1 or 2 (Circle)

Judging Criteria / Entrant's I.D. ----->														
Organization ..... 20 pts. max.														
Originality ..... 20 pts. max.														
Subject Coverage ..... 30 pts. max.														
Interest and Appeal ..... 15 pts. max.														
Workmanship ..... 15 pts. max.														
Total ..... **100 pts. max.**														

I certify these results to be true and accurate to the best of my knowledge and ability.

_____

Judge's Signature

BIBLIOGRAPHY

1. Advance Technical Drafting. Bulletin No. 1751, Louisiana Department of Education. 1985.

2. Architectural Drafting Curriculum Guide. Bulletin No. 1779, Louisiana Department of Education. 1986.

3. Betts, M. Roger, Hauenstein, A. Dean, and Fannin, John W., Exploring the Construction Industry. Bloomington, Illinois: McKnight Publishing Co. 1976.

4. Bush, Vincent G., Safety in the Construction Industry: OSHA. Reston, Virginia: Reston Publishing Co., Inc. 1975.

5. DiDonno, Lupe and Sperling, Phyllis. How to Design and Build Your Own House. New York, New York: Alfred A. Knopf, Inc. 1978.

6. Exploring Construction Technology. Catalog No. 30140, Stillwater, Oklahoma: Mid-America Vocational Curriculum Consortium. 1978.

7. Gerak, Richard M. Exploring Construction. South Holland, Illinois: The Goodheart-Willcox Co., Inc. 1985.

8. Huth, Mark. Introduction to Construction. Albany, N.Y.: Delmar Publishers, Inc. 1980.

9. Journal of Industrial Technology. Vol. 4, No. 2 The National Association of Industrial Technology. Winter 1988.

10. Landers, Jack M. Construction: Materials, Methods, Careers. South Holland, Illinois: The Goodheart-Willcox Co., Inc. 1983.

11. Louisiana Vocational Education Safety Guide. J. Mickey Hebert, The University of Southwestern Louisiana.

12. Lux, Donald G. and Ray, Willis E. The World of Construction. Bloomington, Illinois: McKnight and McKnight Publishing Co. 1970.

13. Lux, Donald G., Ray, Willis E., Blankenbaker, Keith E., Umstattd, William F. The World of Construction. Bloomington, Illinois: McKnight Publishing Co. 1982.

14. Smith, Robert D. Vocational-Technical Mathematics. Albany, New York: Delmar Publisher, Inc. 1983.

15. Vocational Education Curriculum Guide. Bulletin No. 1674. Louisiana State Department of Eduction. 1982.